Vision 2015
Building on Excellence

Waterloo Engineering Strategic Plan
Progress Report 2013/14

WATERLOO
ENGINEERING

November, 2014

This document is published by the Office of the Dean of Engineering.

Please direct enquiries to:
Director of Planning, Faculty of Engineering
University of Waterloo
(519) 888-4567 x32544 | engineering.planning@uwaterloo.ca

Table of Contents

List of Tables and Figures

I. Executive Summary

In November 2010, Waterloo Engineering initiated a comprehensive planning exercise that resulted in the second strategic academic plan for the Faculty of Engineering. Published in May 2012, *Vision 2015: Building on Excellence* presented a set of goals and strategies aimed at achieving our aspiration to be a truly world-class school of engineering.

A key element of planning in the Faculty of Engineering is our commitment to an annual assessment of our current status and a progress report on our plan. This annual review process provides an opportunity to critically examine our plans and to make changes in direction if needed. This report represents the second such progress report on our Vision 2015 plan. Sections III.A-III.K summarize our progress at the Faculty level and Section III.L includes a summary of each academic unit's progress report. Section IV presents high-level key metrics and performance indicators used to assess our progress, supported further by the detailed data in Appendices A-H.

This progress report represents the first stage in extending our Vision 2015 strategic academic plan out to 2018 in order to align with the timeframe of the University of Waterloo's strategic plan, published in fall 2013. Throughout this report, our targets have been updated and extended to 2018. Over the course of the coming year, the Engineering Planning Committee will consult with community members and review our goals and strategies in order to publish in fall 2015 a refreshed strategic roadmap for the Faculty of Engineering that extends to 2018.

Over the past year, hiring has been in line with our faculty and staff plans. In total, 10.5 regular faculty positions (8.5 of which were new positions) and 15 regular staff positions (three of which were new) were filled between May 1, 2013 and May 1, 2014. The extent to which we are slightly below our established faculty and staff complement targets is largely due to positions that have been vacated and are in search. Faculty and staff complements are expected to increase further in the coming years in support of our planned undergraduate program expansion. An operational effectiveness and efficiency project carried out in 2013/14 has resulted in staff changes aimed at enhancing the administrative work and services provided by the Dean of Engineering Office. This new administrative structure should increase our capacity to move our faculty and staff goals forward strategically in the coming year.

We continue to meet our undergraduate targets with very high quality students. Over the past decade, undergraduate enrolment has increased by over 44% to reach a record total of 6,995 in fall 2013. A new phase of undergraduate expansion began in fall 2014 with the launch of a new program in biomedical engineering and the introduction of a second stream of mechatronics engineering. The applicant response to both programs was exceptionally strong, and intake in both programs is expected to gradually increase to reach steady state intake in 2021. Strategies to enhance student success and to improve the learning environment continue to be implemented across the Faculty. Despite student growth resulting in approximately 500 additional required jobs in 2013, employment rates in our highly successful co-operative education program remain high. In the past year we also successfully completed the CEAB accreditation process for all 12 engineering programs.

Our graduate student enrolment has remained relatively stable in recent years, at 1,850 in fall 2013. Graduate student intake decreased between 2012 and 2013, retuning to 2011 levels. Efforts to understand and address the reasons for this decline have been a focus of the past year and will remain a priority in the coming year. Over the past year we have made a number of operational changes and process improvements and established a Graduate Recruitment Working Group to work with the Faculty's Graduate Recruitment Specialist. The Conrad Centre has launched a new certificate and diploma program in business and entrepreneurship for professional master's students.

Research funding earned by Engineering researchers totalled $52.3 million in 2013/14, falling short of target. This was largely due to the deferral of a number of key provincial and non tri-agency programs. Strategies are being implemented to further develop industrial partnerships and access special programs in order to maintain the stable funding required for a quality research program. Other indicators of research excellence, including research chairs, faculty awards and honours, and bibliometric measures of scholarly output all demonstrate strong research performance. Over the past year, our key strategic areas of research strength were identified. A priority for the coming year is to further quantify these areas and to pursue partnerships and funding opportunities aligned with our identified strengths.

Our new teaching portfolio, established as a Vision 2015 priority, completed its first full calendar year in 2013 and continued to develop a strong foundation of initiatives and programming. The Engineering Teaching Development Committee is actively engaging teaching champions in each academic unit in a community of practice that supports teaching excellence across the Faculty. Over the past year, a multi-department Engineering Ideas Clinic™ Committee developed several clinic-based activities to be introduced as pilots aimed at integrating student learning through

hands-on modules. Floor plans and detailed facility specifications were also created for the future Engineering Ideas Clinic™ space in our planned new Engineering 7 (E7) buildling.

To date, we have met our Vision 2015 targets for outreach activities, exceeding our targets for high school programming by such a large margin that they have been increased in this progress report. Efforts to increase the participation of women in engineering have been enhanced through additional initiatives supported by industry partners, including programs focused on coding and entrepreneurship. The Associate Dean, Outreach is working with the new University Diversity Director to enhance inclusivity across the Faculty.

To enhance and consolidate our internationalization activities, a new Associate Dean portfolio was established for internationalization in July, 2014. This office has assumed responsibility for undergraduate international exchange and the development and maintenance of strategic global academic and research partnerships. As we continue to work to further globalize the undergraduate student population and experience, this portfolio will develop mechanisms to increase the support available to our international students.

Our Vision 2015 commitment to enhance the support we provide for entrepreneurship and innovation remains a central priority for the Faculty. In addition to attending to existing programs such as E Co-op, the Bridging Entrepreneurs to Students (BETS) co-op initiative and capstone design awards, the Conrad Centre launched an entrepreneurship option for engineering students in fall 2014. Furthermore, the space plans for the proposed new E7 building focus on providing a space that will foster collaboration, integration, innovation and entrepreneurship.

Of course our Vision 2015 plan cannot be accomplished without the required resources. Engineering Computing is on track to implement its plan to maintain a quality computing environment and to provide excellent computing support. Our Advancement team continues its work to support our plan priorities through philanthropic giving and enhancements to the Faculty's reputation and visibility nationally and internationally. The limitations of our physical space remain perhaps the most significant potential constraint to the achievement of our Vision 2015 goals. Construction of the new E7 building remains the top space priority for the Faculty: Over the past year we have developed an E7 space plan, raised significant funds and received approval from the University Board of Governors for its construction.

This second Vision 2015 progress report marks another year of excellent progress toward our goals. Under the guidance of a dedicated team of leaders, and with the excellent effort of all our students, faculty members and staff, we are working steadily toward securing our place as a world-class school of engineering.

Priorities for 2015

In the coming year, we will continue working on all fronts to make progress on each of our goals. This list of priorities provides a snapshot of the highest priority items among those goals, on which we need to strategically focus to make the most progress possible this year.

- Implement processes in each department to measure graduate attributes as required for the professional accreditation of our undergraduate programs.
- Enhance undergraduate student success and increase retention.
- Move forward on implementing innovative new teaching initiatives, including the Engineering Ideas Clinic™.
- Enhance research outreach and strategic graduate student recruitment.
- Pursue major opportunities in our identified areas of distinguishing research excellence.
- Focus on collaboration and establishing strategic partnerships, in particular the expansion of industry partnerships in emerging areas and the development of strategic research and PhD program partnerships with leading global engineering schools.

Summary of Current Vision 2015 Goals

Goal A1: Increase the Faculty Complement Strategically
Goal A2: Increase the Staff Complement to Appropriate Levels
Goal A3: Establish a Culture of Service Excellence
Goal A4: Improve Internal Communications
Goal A5: Recognize and Promote Faculty and Staff Excellence
Goal A6: Support the Career-Long Development of Faculty and Staff
Goal A7: Fully Engage All Faculty Members
Goal B1: Maintain Relatively Stable Undergraduate Intake Targets
Goal B2: Enhance the Undergraduate Academic Program
Goal B3: Support the Retention of Undergraduate Students
Goal B4: Improve the Undergraduate Student Experience
Goal B5: Increase the Number of Co-op Jobs
Goal B6: Provide Unemployed First Work Term Students a Meaningful Experience
Goal B7: Support the Successful Implementation of WatPD-Engineering
Goal B8: Ensure the Ongoing Accreditation of all Engineering Programs
Goal C1: Strategically Increase Graduate Enrolment
Goal C2: Improve Graduate Operations and Service
Goal C3: Improve the Graduate Program
Goal C4: Enhance the Graduate Student Experience
Goal D1: Increase Research Funding
Goal D2: Establish a Shared Commitment to Research Excellence
Goal D3: Eliminate Barriers to Research Success
Goal D4: Celebrate Research Excellence
Goal D5: Strategically Identify and Assess Research Strengths
Goal E1: Enhance Support for Teaching at the Faculty Level
Goal E2: Contribute to the Development of Faculty Members and TAs as Teachers
Goal E3: Affirm the Importance of Teaching
Goal E4: Support Teaching Innovations and Strategies for Integrating Learning
Goal F1: Expand the Scope of Waterloo Engineering Outreach Programs
Goal F2: Enhance the Waterloo Engineering Community through Participation in Outreach
Goal F3: Increase the Participation of Women in Engineering at Waterloo
Goal F4: Build an Inclusive Atmosphere within Waterloo Engineering
Goal G1: Increase International Undergraduate Enrolments
Goal G2: Increase International Experience Opportunities for Undergraduates
Goal G3: Increase International Graduate Studies and Research Collaborations
Goal G4: Pursue Targeted Collaboration Initiatives in India
Goal H1: Enhance Existing Supports for Entrepreneurship and Innovation
Goal H2: Introduce New Initiatives to Foster Entrepreneurial Activity and Innovation
Goal H3: Develop New Spaces and Infrastructure to Support Entrepreneurship and Innovation
Goal I1: Complete a Comprehensive Update to the Existing Space Plan
Goal I2: Create the Space Required to Meet Operational and Strategic Needs
Goal I3: Harmonize all Aspects of Safety within the Faculty of Engineering
Goal J1: Ensure a Quality Computing Environment
Goal J2: Enhance Support to Computing Clients
Goal J3: Support Improvements to Operational Efficiency and Innovation in Service Delivery
Goal K1: Secure the Philanthropic Support Required for our Priority Initiatives
Goal K2: Enhance the Faculty's Reputation as a World-class Leader in Engineering Research and Education

Vision 2015 Aspiration

Waterloo Engineering aspires to be a truly world-class school of engineering. The programs we offer, the students we graduate, and the solutions we develop will be sought after by outstanding students, employers, employees and partners.

Waterloo Engineering will be:

- the top choice of outstanding high school students from Canada and abroad who are seeking a challenging academic program of the highest quality, fully integrated with real-world experience
- in demand by excellent students, both domestic and international, seeking high-calibre graduate education and by working engineers seeking professional upgrading opportunities
- the destination of choice among Canadian and global employers seeking co-op students or graduates at all levels for full-time employment
- sought after by outstanding engineering faculty looking for a rewarding career that supports teaching and research excellence
- the top choice of industry, government and community partners seeking to connect with outstanding researchers, students, entrepreneurs and innovators to solve local, national and global challenges

Vision 2015 Key Priorities

- Attracting, engaging, and retaining outstanding people: undergraduate students, graduate students, faculty and staff
- Committing to excellence in academic programs and services
- Undertaking high-impact research, both within and across the disciplines and spanning the theoretical to the practical
- Building connections and promoting collaboration
- Fostering innovation and entrepreneurship
- Providing the world-class facilities required to support excellence in education and research

Waterloo Engineering Today

Table 1: Key Metrics: Current Values and Change from the Vision 2015 Baseline (2010/11)

Key Metric	2013/14	Change from 2010/11
Faculty	292	7.6%
Staff	224	15.2%
Undergraduate Students (FTE)	5566	10.7%
Undergraduate Students (head count)	6995	10.2%
International Undergraduate Students	782	69.3%
Female Undergraduate Students	1431	19.5%
Undergraduate Degrees Granted	1160	26.4%
Graduate Students (FTE)	1543	0.6%
Graduate Students (head count)	1850	0.3%
International Graduate Students	824	31.6%
Female Graduate Students	445	0.9%
Research Graduate Students	1349	7.9%
Graduate Degrees Granted	678	18.3%
PhD Degrees Granted	134	42.6%
Sponsored Research Funds ($Ms)	$52.3	-13.4%
Alumni	37,826	14.5%
Space Holdings (nasm)	55,613	17.5%
Permanent Recurring Budget ($Ms)	$74.6	16.1%
Vision 2010 Campaign Progress to Date ($Ms)	$131.0	62.9%

Table 2: Key Performance Indicators: Current Values and Change from the Vision 2015 Baseline (2010/11)

Key Performance Indicator	2013/14	Change from 2010/11
Female Faculty/Total Faculty	16.8%	20.0%
Faculty/Staff	1.3	-7.1%
Undergraduate Students/Faculty	18.5	4.5%
International Undergraduates/Total Undergraduates	11.2%	53.4%
Female Undergraduates/Total Undergraduates	20.5%	8.5%
Undergraduate Degrees Granted/Faculty	3.9	11.4%
Graduate Students/Faculty	5.75	-5.7%
Research Graduate Students/Faculty	4.5	0.7%
International Graduate Students/Total Graduate Students	44.5%	31.3%
Female Graduate Students/Total Graduate Students	24.1%	0.8%
Graduate Degrees Granted/Faculty	2.53	10.0%
PhD Degrees Granted/Faculty	0.5	25.0%
Graduate Students/Total Students	22.0%	-4.3%
Sponsored Research Funds/Faculty	$209,374	-17.5%
Sponsored Research Funds/Permanent Recurring Budget	0.86	-14.9%
Space Holdings/FTE Student (nasm)	8.3	7.1%
Permanent Recurring Budget/FTE Student	$10,522	7.1%

Waterloo Engineering in Context

Table 3: Waterloo Engineering in the Institutional Context, 2013/14

Metric	Share of University of Waterloo
Undergraduate Students (head count)	22.8%
International Undergraduate Students	20.1%
Female Undergraduate Students	10.4%
Undergraduate Degrees Granted	20.8%
Graduate Students (head count)	34.9%
International Graduate Students	52.3%
Female Graduate Students	20.3%
PhD Students	39.0%
Graduate Degrees Granted	36.1%
PhD Degrees Granted	39.9%
Regular Faculty Members	26.2%
Female Faculty Members	16.7%
Sponsored Research Funds	28.9%
Alumni	22.3%

Table 4: Waterloo Engineering in the Provincial and National Contexts, 2013

Metric	Share of Ontario	Share of Canada
Undergraduate Students (FTE)	16.4%	7.0%
International Undergraduate Students	13.5%	5.3%
Female Undergraduate Students	15.9%	6.9%
Undergraduate Degrees Granted	18.3%	8.1%
Graduate Students (FTE)	16.8%	6.7%
PhD Students	20.9%	7.8%
International Graduate Students	22.7%	7.4%
Female Graduate Students	16.6%	6.4%
Graduate Degrees Granted	19.9%	9.3%
PhD Degrees Granted	24.3%	10.1%
Total Faculty	15.7%	6.2%
Female Faculty	15.9%	6.6%

Table 5: Waterloo Engineering in International University Rankings, 2014

Ranking Agency	World Rank	Canadian Rank
QS World University Rankings	57	3
Shanghai Rankings (ARWU)	47	2
Taiwan Rankings	65	2
Times Higher Education World University Rankings	68	4
US News and World Report Best Global Universities	40	2

In addition to our strong standing in the major international university ranking agencies' reviews of engineering fields (summarized in Table 5), Waterloo Engineering was ranked as the top Canadian school (#29 in the world) in the most recent *Business Insider* ranking of the world's best engineering schools[1].

Demonstrating our exceptional strengths in entrepreneurship, the University of Waterloo was ranked as the top Canadian school (in 16th place globally) in a 2014 PitchBook report of top universities worldwide that have produced VC-backed undergraduates[2] and Waterloo was the only Canadian school included on the 2013 CrunchBase list of the top 25 university programs for producing entrepreneurs[3].

[1] http://www.businessinsider.com/the-worlds-best-engineering-schools-2012-6
[2] Pitchbook Venture Capital Monthly, August/September 2014 Edition
[3] http://info.crunchbase.com/2013/08/12/entrepreneurs-and-universities/

II. Alignment with the University of Waterloo Strategic Plan

The University of Waterloo published its strategic plan "A Distinguished Past – A Distinctive Future" in fall 2013. The Vision 2015 aspiration, key priorities, goals and strategies are entirely consistent with the directions set out in the University of Waterloo strategic plan.

Goal Alignment

The table below summarizes how the Vision 2015 goals, as presented in the summary of goals on page 7 of this report, align with the University of Waterloo Strategic Plan goals.

Table 6: Alignment of Vision 2015 and University of Waterloo Strategic Plan Goals

University of Waterloo Strategic Plan Goal	Supporting Vision 2015 Goals
Experiential education for all	B5, B6, B7
Uniquely entrepreneurial university	H1, H2, H3
Transformational research	A1, A7, D1, D2, D3, D4, D5, G3
Outstanding academic programming	A1, A7, B1, B2, B3, B8, C1, C3, E1, E2, E3, E4, G1, G3
Global prominence & internationalization	G1, G2, G3, G4
Vibrant student experience	A1, A2, A3, B4, C2, C4, F2, G2, I3, J1, J2
Robust employer-employee relationship	A1, A2, A3, A4, A5, A6, F2, I3, J1, J2, J3
Sound value system	F3, F4

Timeframe Alignment

The Vision 2015 plan was originally developed as a plan for 2010-2015. Given the subsequent publication of a five-year plan for the University as a whole in 2013, a decision was taken to extend our original Vision 2015 plan to 2018 to align with the University plan's timeframe. This extension is being implemented in two stages:

- Over the past year, the Engineering Planning Committee has reviewed and updated all of the original Vision 2015 targets, extending each out to 2018 to align with the University plan's timeframe.
- In the coming year, the Engineering Planning Committee will consult with our community members and review the current Vision 2015 goals and strategies, editing and augmenting them as necessary to ensure a complete and appropriate strategic roadmap is in place for the Faculty of Engineering through to 2018. We anticipate publishing a refreshed and extended set of goals and strategies for the Faculty with our progress report in fall 2015.

The Vision 2015 plan aspiration, key priorities and baseline will not change in the context of this extension.

Accountability Alignment

As this progress report was being prepared, an implementation plan and accountability document to support the University of Waterloo strategic plan was shared with university leadership and governance. Over the coming year, as we review our goals and strategies to extend the Vision 2015 plan to 2018 we will also look to these new University plan documents to further refine our performance measurements and metrics as appropriate.

III. Vision 2015 Strategic Plan Progress Report

A. Faculty and Staff

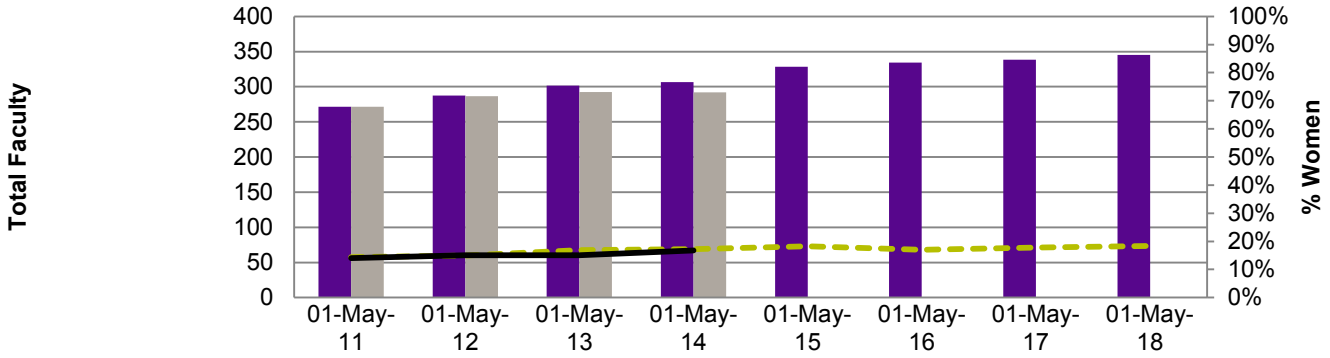
Over the past decade, our regular faculty complement has grown by 38.5% (see Figure 77) and our staff complement has grown by 49% (see Figure 84). These and other information about our faculty and staff complements are presented in Section IV.A of this report.

Overall, we have made good progress on our Vision 2015 faculty and staff goals to date. While our hiring plans are progressing well, we are slightly below our faculty and staff complement targets due to vacancies resulting from retirements and resignations. Hiring will remain a major priority in the coming years as growth in faculty and staff accelerates in support of our new undergraduate program in biomedical engineering and the addition of a second stream of students to our high-demand mechatronics engineering program.

Goal A1: Increase the Faculty Complement Strategically

- The updated targets provided in Figure 1 include new faculty positions created to support our new undergraduate program in biomedical engineering and expansion of the mechatronics engineering program.
- By May 2018, we expect to grow our faculty complement by almost 27% or 75 positions over the plan's baseline.

Figure 1: Faculty Complement Plan Performance to Target



	01-May-11	01-May-12	01-May-13	01-May-14	01-May-15	01-May-16	01-May-17	01-May-18
Target Total	271.4	287.4	301.4	306.4	328.4	334.4	338.4	345.4
Actual Total	271.3	286.3	292.3	291.9				
Target % Women	14.4%	15.0%	16.9%	17.2%	18.2%	16.9%	17.8%	18.4%
Actual % Women	14.0%	15.0%	15.1%	16.8%				

Fill all open faculty positions and establish new positions in strategic areas

- 10.5 regular faculty positions were filled (of which 8.5 were new positions) and 11 positions were vacated between May 1, 2013 and May 1, 2014. An additional two faculty members had accepted positions (one new, one replacement) but had not yet started their appointment on May 1.
- On May 1, 2014 searches were underway to fill 22 positions (10 new and 12 replacements) across the Faculty.
- The proportion of faculty who are women has increased significantly over last year, approaching target.

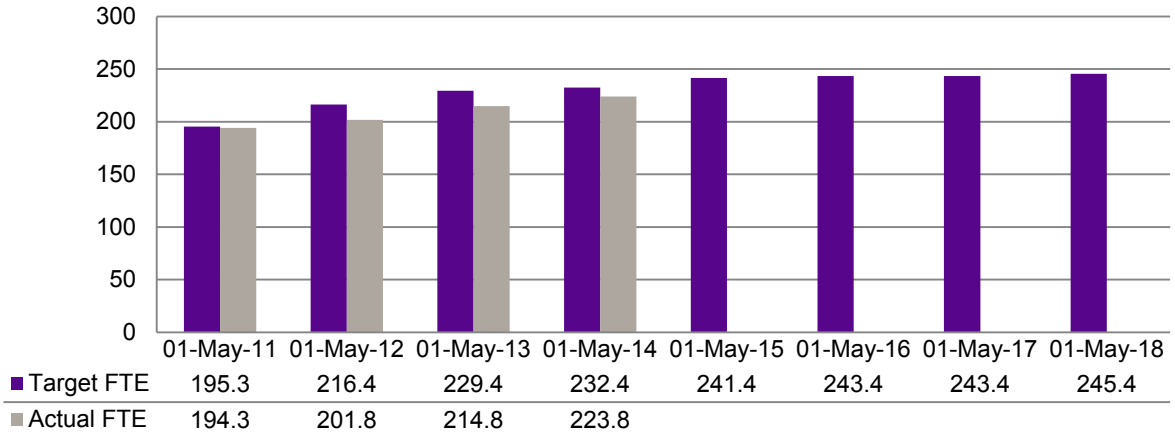
Recruit and hire outstanding faculty

- Engineering is committed to taking the time required to hire an excellent candidate for every faculty opening. The increasing distribution of schools from which our faculty have earned their PhD degrees (see Figure 79) is one indicator of the high quality of faculty we are hiring.
- Faculty hiring will remain a key focus across Engineering in coming years: In addition to the ambitious hiring plan outlined in Figure 1 above, the age distribution of our current faculty (see Figure 81) suggests we should also anticipate a number of retirements.
- Additional ongoing strategic initiatives to ensure a strong pool of candidates and a thorough assessment of their candidature are described in the teaching and women in engineering sections of this report.

Goal A2: Increase the Staff Complement to Appropriate Levels

- The updated targets provided in Figure 2 include additional new staff positions established in support of our new undergraduate program in biomedical engineering and expansion of the mechatronics engineering program.
- We will grow our staff complement at a rate commensurate with the faculty growth projected above (almost 26% or 50 positions over the plan baseline by May 2018).

Figure 2: Staff Complement Plan Performance to Target



Add staff positions at appropriate levels to manage workload and support strategic initiatives

- 15 staff positions (three new positions and 12 replacements) were filled between May 1, 2013 and May 1, 2014.
- As of May 1, 2014 searches were underway to fill four additional positions (two new, two replacements).

Facilitate reorganization for increased capacity, improved efficiency and enhanced service

- In 2013/14 we completed an operational effectiveness and efficiency project, supported by Human Resources and an external consultant, to enhance the administrative work and services provided by the Dean of Engineering Office. As a result of this exercise the Executive Officer (EO) role was revised to better align with our strategic growth plans and the new role of Faculty Administrative Officer (FAO) was established to provide operational leadership within the Faculty. As of September 1, 2014 both roles are filled: Andrea Hagedorn is our new EO and Donna Kellendonk is our inaugural FAO.

Goal A3: Establish a Culture of Service Excellence

Provide staff development opportunities related to client service, recognize and reward excellence in client service, and share best practices in client service among the Faculty's various units.

- While Faculty-level progress on this goal has been limited over the past year, we anticipate that this priority area will move forward under the new administrative structure in the Dean's Office over the coming year.
- Many offices are implementing strategies to enhance client service. For example, Engineering Computing and the Engineering Undergraduate Office continue to implement single point-of-contact access points to simplify client access to their services.
- As one example of our commitment to service excellence within the academic units, the Department of Civil & Environmental Engineering formally considers client service during annual staff performance appraisals.

Goal A4: Improve Internal Communications

Establish an internal communications framework and tools to best meet faculty and staff needs

- The communications team undertook an audit of internal and external communications in winter 2014, including an Eng-e-News focused survey sent to staff and faculty. In 2014/15 this work will be extended to determine the effectiveness and impact of our newsletters and our publications and, based on those findings, to recommend changes to the way information is delivered.

- The Engineering Communications Council reconvened in late 2013 as a venue to share University-wide and Engineering communication, marketing and strategic updates, as well as best practices. Engineering editorial and events calendars were introduced to keep staff and faculty up to date on Faculty activities.
- In the coming year, the Dean will begin holding regular lunch meetings with small groups of staff who are either new to Engineering or who would like the opportunity to meet the Dean and share their thoughts on their experience in the Faculty.
- Starting in September, 2014, all members of the Waterloo Engineering community will receive regular emails with updates from the Dean to celebrate achievements within the Faculty.

Goal A5: Recognize and Promote Faculty and Staff Excellence

Increase nominations to internal and external awards and honours

- The Engineering Awards and Honours Committee has been meeting on a regular schedule since fall 2013 and is now professionally supported by a technical writer from the Engineering Research Office who is providing project management, editorial and nomination preparation support.
- These enhanced resources have already resulted in many successful nominations to prestigious external awards and honours in 2013 as outlined in the research section of this report and in Table 6 of Appendix V.A
- Many new honours and awards – including memberships in Canada's and Ontario's most prestigious honorific societies – have also been earned by our faculty members in 2014. (A complete list of 2014 awards will be included in the next Vision 2015 progress report.)
- The 2014 Waterloo Engineering Outstanding Staff Award was awarded to Kirsten Deckert of Systems Design Engineering and Jim Baleshta of Mechanical & Mechatronics Engineering. Faculty members who earned internal Faculty of Engineering awards are listed in the teaching and research sections of this report.

Establish additional awards within Waterloo Engineering

- Establishing a Waterloo Engineering Award of Excellence in Graduate Student Supervision is a priority for the coming year.

Goal A6: Support the Career-Long Development of Faculty and Staff

Identify and promote development opportunities for faculty and staff

- In addition to the many commitments made to the development of staff and faculty in each of our academic and administrative units, a number of Faculty-wide development opportunities were offered:
  - 30 staff managers from the Faculty of Engineering attended a training session on the University's revised staff employment policy co-ordinated by the Dean of Engineering Office in fall 2013.
  - The Associate Dean, Teaching facilitated an Instructional Skills Workshop, a workshop on engaging student attention in large classes, and a series of five sessions to help develop understanding of teaching/learning effectiveness for engineering faculty in 2013.
  - The Engineering Research Office offered information sessions on NSERC Discovery Grants and NSERC Strategic Grants and a workshop on the Early Researcher Award in 2013. Approximately 20 to 30 faculty members attended each.

Establish a culture of mentorship

- Across Engineering, new faculty members are connected with mentors through different mechanisms, ranging from the assignment of a formal mentor to the facilitation of connections with informal mentors.
- Mentorship specific to teaching development is available from each department's teaching champion as well as the Associate Dean, Teaching.

Identify and cultivate future leaders

- 11 staff members from across Engineering participated in leadership programs through the University Organizational and Human Development Office in 2013.

Goal A7: Fully Engage All Faculty Members

Promote a holistic and integrated view of teaching and research and maintain the engagement and contributions of all members of our highly capable professoriate

- At its 2014 retreat, the Engineering Planning Committee shared current efforts and known best practices in facilitating responsive workload distributions that recognize, accept and appropriately reward faculty members' changes in focus over the course of an academic career.
- It is anticipated that, with the new administrative support structure in the Dean's Office, consistent data can be gathered in the coming year from all academic units in order to establish a more complete aggregated picture of current workload distribution among faculty members.

B. Undergraduate Studies

This report marks the final plan progress report to be prepared by Prof. Wayne Loucks, who has made a remarkable contribution to Waterloo Engineering over his 16 years as Associate Dean, Undergraduate Studies. In that context, Associate Dean Loucks has prepared this year's report, including some future recommendations, as a tool to prepare a strong foundation for the next Associate Dean's success and the ongoing strategic development of this key portfolio.

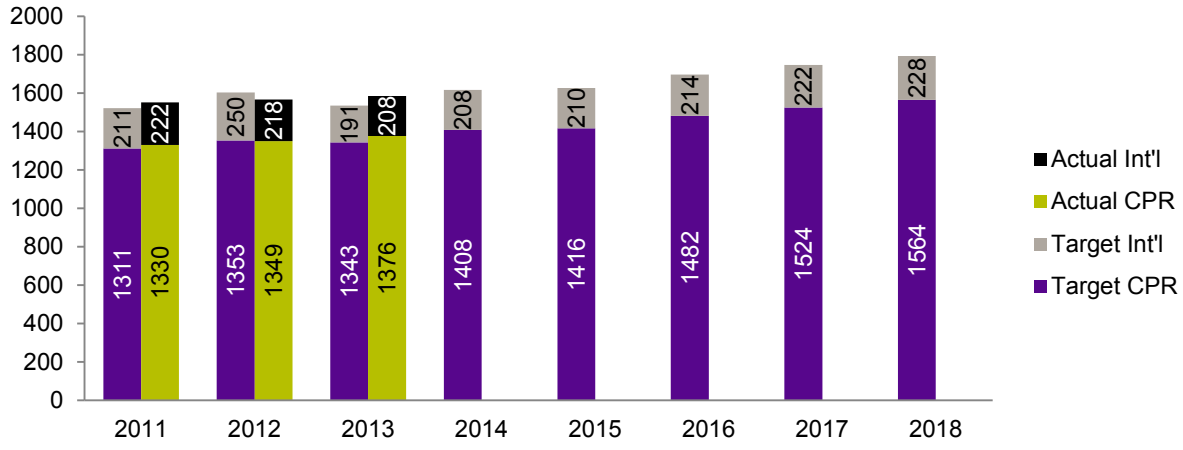
Over the past decade, our undergraduate enrolment has increased by over 44% (see Figure 90), to a record total of 6,995 students as of November 1, 2013. Despite this increase, the size and quality of our applicant pool continues to steadily increase as noted in Figure 95: in 2013 we reached a record high of 73% of entering students with a final high school average of 90% or higher. Section IV.B of this report provides further measures and key performance indicators about our undergraduate students and programs.

We continue to meet our intake targets and make strong progress on recommendations for improvements to first-year engineering. Work continues toward many of our undergraduate goals that require consensus from multiple stakeholders, often within and outside the Faculty of Engineering. One significant change reflected in this report relates to our goal for limited undergraduate enrolment growth (Goal B1), as we update our intake targets to reflect undergraduate growth plans in biomedical engineering and mechatronics engineering.

Goal B1: Maintain Relatively Stable Undergraduate Intake Targets

- Subsequent to the establishment of our original Vision 2015 plan targets, which called for only small undergraduate growth, the decision was made to introduce a new biomedical engineering program and expand our existing mechatronics engineering program to a second stream (see below). The annual intake into these two new/expanded programs is expected to grow over the 2014 to 2021 period, as reflected in our revised undergraduate targets (Figure 3).

Figure 3: Undergraduate Intake Plan Performance to Target



Expand high-demand interdisciplinary undergraduate education

- Our new program in biomedical engineering was approved and launched in fall 2014 with extremely strong applicant response, both in terms of numbers and quality, placing it as our most competitive program. Likewise, even with additional spaces available through the introduction of a second stream, applicant numbers to mechatronics engineering increased significantly such that it remained one of the top three

competitive programs for admission. At the current application levels, no problems are anticipated for the planned continuing expansion in these programs over the next several years.

Enhance the international applicant pool

- Although visa student applications continue to grow and are satisfactory for our current targets, the visa applicant pool is not as strong as might be desired. This is due to several factors, including: lower yield on applications; ineligible applicants due to insufficient English language skills; and a relatively high proportion of applicants who do not submit transcripts or other required information.
- As described in the internationalization section of this plan (see Goal G1), we will continue to strategically focus our international undergraduate student recruiting efforts.

Review and revise mechanisms to identify the best possible future students from our strong applicant pool

- Continuing growth in application numbers has strained our applicant selection criteria to the point that many of the incoming 2014 classes have entrance averages in the low to mid 90's, with few students less than 90%. This compression of the grade range may exclude many applicants with mid- to high-80's averages who may have desirable qualities that fit better with our co-op programs (for example entrepreneurial interests, significant summer and part-time work experience, or hands-on skills). We are in the process of revising how we can screen for such students. This may result in a small decrease in admission averages, but may help improve the non-academic quality, diversity, and work preparedness of the entering classes.

Goal B2: Enhance the Undergraduate Academic Program

Foster consistently high quality teaching by all instructors

- Progress on our teaching goals is reported separately in Section E of this report.

Redesign and modernize the lab experience

- Mechatronics engineering continues to be the leader across the Faculty in the successful use of common hands-on projects to integrate learning. Currently a project is used to integrate learning across three first-year courses, and aspirations are to integrate the remaining two 1A courses in future offerings. Sample projects used to date include keychain fabrication, bicycle dissection, gas engine disassembly/assembly, Arduino microcontrollers and LEGO Mindstorm robots.
- Mechanical engineering is introducing a second concepts course in their 1B term (to be offered for the first time in winter 2015) that will use a clinic-based learning environment and a LEGO Mindstorm robot kit.
- Software engineering, electrical engineering and computer engineering are currently in the discussion phase of integrating courses and having a robot lab in first year.
- As detailed in Goal E4, the Engineering Ideas Clinic™ Committee has started to develop a number of hands-on projects for all first-year students.

Ensure a modern, high-quality learning environment

- In 2013/14, $1.5M was invested to improve learning facilities through the Vision 2015 Undergraduate Lab Enhancement Initiative, bringing the total to date to approximately $4.5M. Additional funds are also allocated to lab enhancements from department budgets, donations and WEEF fund proposals. These investments have directly improved lab space, equipment and facilities across the Faculty in lab courses, computing rooms and the Sedra Student Design Centre.
- As the use of hands-on projects increases across the Faculty and the most active program in this arena expands to introduce a second stream, the existing shortage of space for students to work on and demonstrate these projects will only become more critical in the coming years. It is anticipated that the expansion of the student shop into East Campus Hall and the construction of Engineering 7 and its Engineering Ideas Clinic™, described more fully in the space section of this report, will provide much-needed space for these important activities.

Introduce a unique learning environment to Waterloo Engineering

- Progress toward development of the Engineering Ideas Clinic™ is reported in Goal E4 of this report.

Enrich student understanding of the curriculum structure and relevance

- The increasing use of hands-on projects for integrated learning (described above) and the implementation of the Engineering Ideas Clinic™ (see Goal E4) will both contribute to student understanding of curriculum structure and its relevance to engineering.

Goal B3: Support the Retention of Undergraduate Students

Enhance first-year student success

- The recently-established tutor centre is well used by TAs and students for drop-in help sessions, one-on-one help for students, mini-tutorial sessions and before exam help sessions. In addition to the tutor centre, the WEEF Lab, the rooms at the back of the lab and the corridors outside it are also furnished to serve as places where TAs will help students or where students will go for group or independent study. Significant progress has been made toward reducing student traffic into teaching team offices, but the importance of separating office space and student help areas must continue to be stressed to tutors, TAs and students.
- The university skills course (GENE 101) has been co-developed and co-taught by Associate Director of First Year, Bill Owen, and Student Success Office staff over the last four years. This shared responsibility for updating and teaching is likely to continue in the future.
- We have begun to analyze data about students who are opting into and out of the reduced load program during their first 1A term and their success rates and term averages in subsequent terms. Early findings from these data include:
  - Opt-in rates are typically less than 20%.
  - Success rates and averages of students who opt in compared to opt out are in the same range. Thus, it is difficult to definitely say that the program is saving students who would have otherwise been unsuccessful, or that their averages are any higher than those who opt out. More data are needed to follow students after 1B to determine if there is a long-term impact of the reduced load program. This result may also be an indication that we may not yet be attracting the correct group of students to the program.
  - Success rate in the second 1A term is a perfect 100% and term averages are high. It is believed that the main contributing reasons for this are that students are in a reduced load from beginning of the term, are in smaller classes, and get personalized attention. The GENE 101 course also tends to increase the term average.
  - The success rates of students in the reduced load program are about double that of the QPR program.
  - Anecdotally, students who opt in appreciate the reduced load program and see its benefits.
- A clear process forward on English language support is yet required in the Faculty. In addition to the Vision 2015 objective to address communication skills for engineering students, the University strategic plan has identified a need for communication throughout the curriculum as a major thrust for all programs. The University process is starting by focusing on first-year student needs. Engineering has little will for a common approach at the Faculty level and current plans vary among departments. Ongoing concerns relate to whether non-native English speakers will get the help they need from this varied approach and preparing the Faculty for the anticipated end to the ELPE.
- Progress continues on implementation of the recommendations of the Engineering Education for Enduring Success report: Approximately 60% of the 25 recommendations (R6 – R19 and R25) have been completed and implemented and 10 others (R1 - R5, R20 – R24) are partially completed. To date, R5 (modifying the curriculum to promote mastery) and R21 (assigning a full-time lecturer to care for first-year students) have seen minimal progress. Specific areas of progress include:
  - Modifying the AIF to provide more insight into applicants (R16): Completed. The scoring rubric on the AIF was revised to emphasize four general attributes: sense of purpose, commitment and engagement, employability and excellence. The impact of the AIF on admission decisions has effectively remained the same, but the way in which the score is calculated has been modified somewhat.
  - Integrating life skills into 1A courses (R4): Partially completed. Civil & Environmental Engineering programs do this as part of their concepts course and Electrical & Computer Engineering has initiated this process in a concepts course. The two Associate Directors of First Year visit all programs and give three one-hour lectures on study skills, time management, life balance, exam preparation, exam anxiety, promotion rules and the reduced load program. Workshop attendance by students is voluntary.
  - Updating the hiring practice for Engineering Instructional Support Tutors (EIS) to emphasize teaching (R17): Partially completed and ongoing. The two Associate Directors of First Year are now responsible for WEEF TA hiring. For the hiring of the two new EIS Tutors, the applicants were required to give a mini-tutorial or solve a sample problem during interviews.
  - Enhancing TA training (R18): Completed and ongoing. Lunchtime sessions are offered by the two Associate Directors of First Year to TAs to improve their marking, proctoring, tutoring, presentation and teaching abilities. The First Year Office started delivering its own version of ExpecTAtions in fall 2013.

- The issue of student loading is part of recommendation R23, but as yet very limited related information is available. Attempts have been made by the Director of First Year to obtain expectations from course instructors, but response rates are low and variable. Attempts to poll students informally have resulted in an estimate of 50-60 hours per week, although individual students can vary by a large amount around this mean. An in-depth study on this topic will be useful.
- As we approach six years since the publication of the Engineering Education for Enduring Success report it is time to more closely assess our progress and the success and limitations of changes made. It is recommended that the Dean strike a new taskforce to assess first-year opportunities and challenges. This taskforce will provide the next Associate Dean, Undergraduate with a roadmap for possible changes.

Support student success at all levels

- Starting in 2014 there has been a refocusing of the Student Success Office to provide support to various Faculty initiatives related to student success. The appointment of a Senior Faculty Relations and Academic Support Specialist with responsibilities including Engineering provides a framework for improved effectiveness and support. It is anticipated that there will be more to report in 2015.
- The Engineering First Year Office and the Student Success Office both support (mainly) first-year students in academic courses, life skills issues, time management, and other related areas. The First Year Office, the Director and Associate Directors are very tightly integrated with the students. Currently we direct students towards the Student Success Office when the First Year Office cannot deal with their issues, including English language support and extended help with life skills and time management issues.
- In addition to the first-year English language initiative challenges described above, a secondary goal of the University English language initiative is to facilitate support in second- and third-year courses. At this time there are only very tentative steps by some engineering departments to engage other units for communication support after first year.

Goal B4: Improve the Undergraduate Student Experience

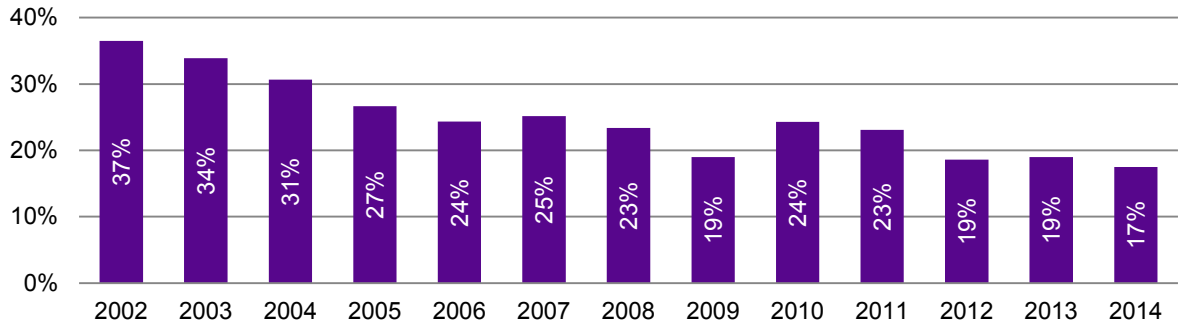
Improve service and communications

- Preliminary steps have been taken toward the assessment of student traffic and service quality. Short-term traffic studies for first-year advisors counted about 2,000 significant visits in the past year, excluding drop-in visits. Looking ahead, we hope to enable the exchange calendar tracking tool for Engineering Undergraduate Office users. It is anticipated that with this tool and consistent appointment booking by the Engineering Student Services Advisors, we should have better data on traffic intensity. We have not yet identified an effective way to assess service quality as seen by students.
- In addition to visits we continue to use generic “Ask Us” email addresses for general questions (eng.ug.askus@uwaterloo.ca), academic support for first-year students (firstyear.engineering@uwaterloo.ca) and exchange questions (eng.ug.exchange.askus@uwaterloo.ca). These addresses allow us to allocate multiple members of our team to the task of providing answers to our students.

Enhance undergraduate processes

- The required courses have been developed and approved to facilitate interdisciplinary fourth-year design projects: GENE 403 was offered for the first time in spring 2014 with 13 students from across three programs.
- Figure 4 illustrates the fraction of students in 4B who are registered for an engineering option (options and minors from other Faculties are not included in these data). Observations from this figure include:
  - We have experienced a gradual but steady drop in the fraction of engineering students earning options. Although the number of 4B students with options has not changed dramatically (2002 had 257 and 2013 had 259), the number without options changed significantly (2002 had 527 and 2013 had 1062). More work is needed to understand this change.
  - Potential reasons for this decline could include declining student interest in getting options, increasing difficultly to earn options as the Faculty has grown, and fewer opportunities for students to blend an option with their program requirements (in particular for newer programs to the Faculty such as architecture, software and nanotechnology). It is also worth noting that management engineering students do not qualify for the management sciences option, one of the more popular options in the other disciplines.
- To date there has been no progress on addressing known limitations in our promotion rules, which remains a challenge and a priority.

Figure 4: Fraction of 4B Registrations with Options



Develop an annual student engagement survey

- The Faculty of Engineering undergraduate student engagement survey was run in June-July, 2014. 514 responses were received, with responses from every program.

Work with Waterloo International to successfully implement the new institutional exchange process

- To reflect the transition of this operation to the new Associate Dean, International portfolio, progress toward this strategy is reported in the internationalization section of this plan (see Goal G2).

Co-operative Education

Co-operative education continues to be a highly successful defining feature of Waterloo Engineering. Employment rates remain high despite an increase of approximately 500 jobs required in 2013 compared to the previous year. This success can be partially attributed to growth in the number of international jobs over the last two years (see Figure 96). Continued efforts are required to develop jobs for first-work-term students and to accommodate growth resulting from the planned undergraduate expansion.

In addition to our Vision 2015 plan goals for co-operative education, the experiential education theme of the University strategic plan has established an expectation for formal reflection in work-term reports. A Faculty-level response is needed to adapt to this requirement: This is a long-term initiative that will require the involvement of the next Associate Dean, Undergraduate.

Goal B5: Increase the Number of Co-op Jobs

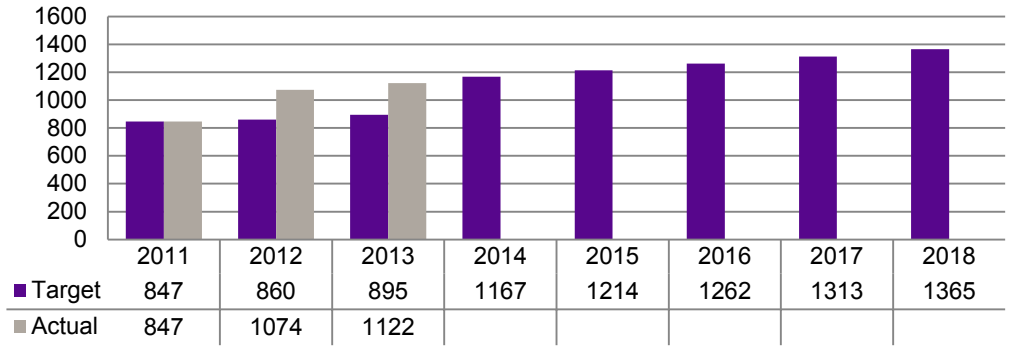
Implement a program-focused initiative to assist in job development

- A lack of measurable success with earlier efforts in this activity has led to a revised approach: Co-operative Education and Career Action has identified programs that have a relatively low job-to-student ratio and employer relations staff are being directed to prioritize these programs, with established new job targets.

Develop additional international work term opportunities

- Figure 5 shows that the number of international jobs in 2013 substantially exceeded the original target, for the second consecutive year. Targets for the remaining years of the plan have been revised upwards to reflect this success.

Figure 5: International Co-op Work Terms Performance to Target



Launch a research co-op (R Co-op) program

- A white paper on the development of an R co-op designation has been prepared and discussed with the Associate Provost, Resources. In the coming year the development of the designation will be negotiated with other Faculties and support units.

Goal B6: Provide Unemployed First Work Term Students a Meaningful Experience

Develop a program to enhance the employability of unemployed first-work-term students during their next work term

- The Bridging Entrepreneurs to Students (BETS) program was successfully delivered in spring 2013 and winter 2014. Each term 20 students participated in the program, representing nine different engineering programs. More information is presented about BETS in Goal H2 of this report.

Goal B7: Support the Successful Implementation of WatPD-Engineering

Ensure sufficient selection of current WatPD courses for engineering students

- There are eight elective WatPD courses, including one WatPD-Engineering course on professionalism and ethics in engineering practice that aims to prepare students for the Professional Engineers Ontario Professional Practice Exam. A second course on professional responsibility in computing will first be offered in winter 2015.
- One of the two core WatPD-Engineering courses, developing reasoned conclusions, has been undergoing redevelopment and revitalization as part of WatPD's regular renewal cycle.
- Current satisfaction levels with WatPD electives has reduced the need for engineering-specific electives; however, the WatPD-Engineering Curriculum Committee, which meets on average once per term, is ensuring that we do not miss specific professional development opportunities for our engineering students.

Establish a framework to assess the WatPD-Engineering program's effectiveness

- An in-depth evaluation of the effectiveness of the WatPD program as a whole, known as the HEQCO Report because it was sponsored by the Higher Education Quality Council of Ontario, was completed in 2014 and is available online. Now that there is strong baseline data from the HEQCO report, WatPD is evolving its evaluation plan to include new quantitative and qualitative measures of student learning outcomes.
- Current evaluation practices for WatPD-Engineering include pre- and post-test scores, end-of-course surveys, grades, and pass rates.

Accreditation

A major activity in the past year was the preparation for and carrying out of the CEAB accreditation of all 12 engineering programs. A site visit was held in November, 2013 and responses to the visiting team report were prepared. Ultimately the CEAB decisions were quite positive with nine programs receiving the maximum accreditation period of six years and three programs being required to submit a progress report after three years. In addition, the faculty continues to develop an outcomes-based process for program improvement that is mandated by the CEAB.

Goal B8: Ensure the Ongoing Accreditation of all Engineering Programs

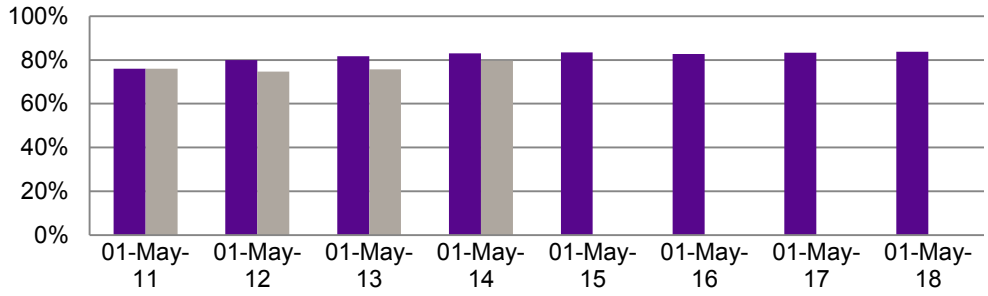
Implement a system of outcomes assessment for all programs

- All 12 programs continue to develop their outcomes assessment process. A set of guidelines for conducting assessments and reporting was developed by the Associate Dean, Co-operative Education and Professional Affairs and agreed to by all programs.
- Substantial additional resources in the form of six lecturer positions and four administrative staff positions have been provided by the Provost, Dean and Departments to support the outcomes assessment process. It is anticipated that the academic units will complete these hires in 2015.

Increase the proportion of eligible faculty members who are licensed professional engineers

- The fraction of faculty who are registered or have applied for professional registration increased by 4% in the past year, reducing the gap to reach our targets. Efforts to encourage faculty to register continue.

Figure 6: Regular Faculty PEng Status Performance to Target



	01-May-11	01-May-12	01-May-13	01-May-14	01-May-15	01-May-16	01-May-17	01-May-18
Target % Registered&Applied	76.0%	79.9%	81.7%	83.0%	83.5%	82.7%	83.2%	83.8%
Actual % Registered&Applied	76.0%	74.7%	75.7%	79.7%				

C. Graduate Studies

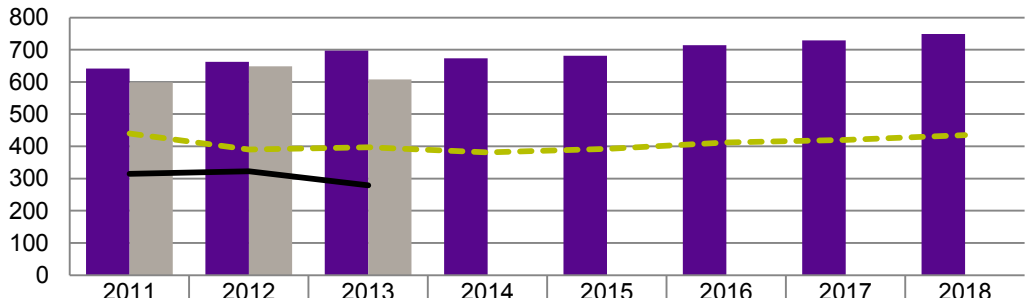
Over the past 10 years, our graduate enrolment has increased by over 51% (see Figure 104). Most of this increase occurred in the first half of that decade; total enrolment has been relatively stable in recent years and the proportion of visa students has increased. Efforts to understand and address the reasons for declines in domestic graduate student intake have been a focus of the past year and will remain a priority in the coming year. Our academic units have each also reassessed their intake targets out to 2018 in the current recruitment context. The results of this reassessment are reflected in Figure 7 and Figure 8.

A number of graduate studies metrics are provided in Section IV.C of this report. Additionally, because our graduate students contribute actively to our research programs and research funding is central to graduate student support, our graduate studies and research plans are strategically connected and impact one another.

Goal C1: Strategically Increase Graduate Enrolment

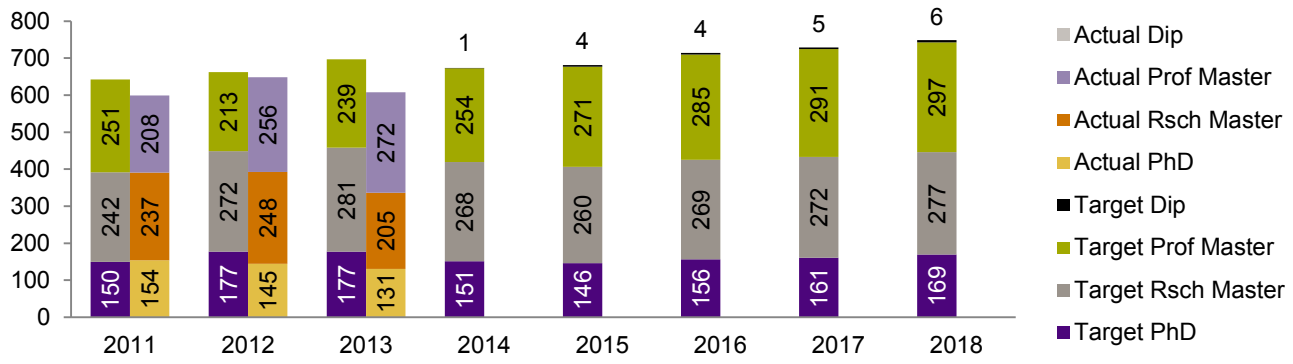
- Intake in 2013 was almost identical to intake in 2011 (see Figure 7). Overall graduate intake in 2013 dropped by 6% compared to 2012. CPR student intake declined by 13.6%. The reasons for this decline are not yet known; however, it is perhaps in part linked to the decline in research funding (see Figure 9).
- Figure 106 shows that the ratio of total students and of research students to tenured/tenure-stream faculty has remained relatively constant over the past six years. The graduate student proportion of total student enrolment in engineering has declined (see Figure 108). This reflects decreases in graduate intake in 2013 relative to 2012 and continued growth in the undergraduate population.
- As indicated in Figure 8, student intake in 2013 reached 74% of target in PhD programs and 73% of target in research master programs. Only professional master program intake exceeded target, at 113%. Preliminary data for 2014 suggest that intake in 2014 will show growth over 2013; however, the magnitude of this growth is yet to be confirmed.
- Going forward, our graduate intake targets have been adjusted to reflect the current context.

Figure 7: Graduate Intake Plan Performance to Target by Visa Status



	2011	2012	2013	2014	2015	2016	2017	2018
Target Intake	642	662.4	696.9	673.7	681.1	713.9	729.1	748.5
Actual Intake	598.9	648.8	607.6					
Target CPR	439.4	390.2	397.6	381	392.5	412	419.9	434.5
Actual CPR	314.3	322.4	278.4					

Figure 8: Graduate Intake Plan Performance to Target by Program Type



Enhance the professional master's program

- As reported in the academic unit plans in Section III.L, each unit has set a strategic direction for the appropriate role and development of the professional master in its graduate program.

Develop and implement a strategic recruitment plan for graduate studies

- Graduate student recruitment remains a key priority area. A Graduate Recruitment Working Group has been established, with staff and faculty representation from each department as well as the Associate Dean, Graduate Studies and the Faculty Graduate Recruitment Specialist. The working group will be meeting monthly to co-ordinate recruitment activities and develop recruitment initiatives to improve the quantity and quality of graduate student intake.
- Funding to support research graduate students remains a significant constraint, in particular for PhD students. A new initiative will be introduced in 2015 for faculty members accepting new domestic research students.
- Three initiatives were undertaken in the past year to improve recruitment of Waterloo Engineering undergraduate students into graduate programs: changes were made to the Accelerated Master's Program to increase awareness among undergraduates and to make the program more attractive; changes were made to the use of NSERC Undergraduate Student Research Awards (USRA), significantly increasing the number of awards that were used by engineering undergraduate students; and a new award was created, funded by the Dean, to match the NSERC USRA for students enrolled in the Accelerated Master.

Goal C2: Improve Graduate Operations and Service

Provide excellent service to all clients

- The Vision 2015 plan identifies the addition of one staff position in the Engineering Graduate Studies Office (EGSO). The goal was to fill this position by the start of 2014. However, due to an earlier than anticipated retirement and a University-wide hiring freeze, this hiring was deferred until fall 2014.
- A new staff member was hired in the EGSO to replace the retirement and some changes in staff responsibilities have been made with the goal of providing better workflow management.

Improve the quality and delivery of information

- We aim to begin migrating material from the Engineering Graduate Studies Manual online by the end of 2014.
- A study of information flow to identify where changes can be made to simplify and streamline processes is underway. The Graduate Recruitment Working Group will identify and propose solutions for issues related to the recruitment of graduate students.
- The EGSO is reviewing Faculty-level forms and processes and will be revising and updating these as required over the 2014/15 academic year. As these are refined, they will be placed on the website.

Ensure timely processing of applications and admission correspondence

- A new (earlier) application deadline was introduced for admission for the fall 2014 term (February 1) and will remain in effect for 2015 applications. Preliminary results suggest that the new deadline is beneficial as it is consistent with deadlines from peer institutions and major scholarship programs (including tri-council).
- The EGSO has implemented Faculty deadlines for admissions processing for winter 2015 to encourage departments to submit recommendations in time to be competitive with other offers the students may receive.

- The EGSO will continue to work to improve communications and co-ordination with departments about application deadlines and requirements and about admissions processing times.

Develop an effective and efficient strategy for managing cases of academic discipline and grievances

- Efforts to develop effective and efficient procedures to manage Policy 71 (Student Discipline) and Policy 70 (Petitions and Grievances) cases involving our graduate students have begun by involving the Academic Integrity Co-ordinator for the Faculty of Engineering in cases involving graduate students.

Goal C3: Improve the Graduate Program

Foster consistently high quality graduate student supervision

- Engineering faculty members, in particular new faculty members, have been made aware of the University Graduate Studies Office's online guide for graduate research and supervision.
- Revisions have been proposed to the regulations concerning Approved Doctoral Dissertation Supervisors (ADDS), including changes to the range of methods by which faculty members may demonstrate they have met the requirements for ADDS approval. One of these new methods is successfully completing a workshop, being developed by the University Graduate Studies Office, addressing the roles and responsibilities of the faculty supervisor and the graduate student and related University regulations and policies.
- The need for an Engineering-specific expectation document and faculty information sessions related to graduate student supervision will be re-assessed after the University level workshop has been developed and the proposed ADDS regulation has received final approval.
- The Waterloo Engineering Award of Excellence in Graduate Student Supervision is yet to be established.

Improve graduate course offerings

- The range of graduate course offerings has continued to improve through the introduction of new courses and the modification or renewal of others. The level of improvement does not appear to be uniform across departments.
- The Associate Dean, Graduate Studies will continue to work with departments to seek ways to increase the number of graduate courses offered; to minimize duplication of courses offered by different departments; and to review courses, particularly those with consistently low enrolments, for relevance.

Increase the academic rigour of graduate programs

- The Electrical & Computer Engineering Department is embarking on changing its PhD comprehensive exam format. Related discussions will take place with other departments in fall 2014.
- The EGSO has begun to more strictly enforce existing requirements for program limit extensions and comprehensive exam time limit extensions.

Improve the quality of students admitted to graduate programs

- Discussions are continuing with academic units and the Graduate Recruitment Working Group on how best to continue to improve the quality of students admitted to the graduate programs.

Goal C4: Enhance the Graduate Student Experience

Evaluate current graduate student funding

- The actual level of funding that Waterloo Engineering research graduate students receive (which is typically much higher than the guaranteed minimum level) is now being used in marketing and recruitment efforts.
- Strategies to improve the level of funding (including incentives for recruiting) for domestic PhD students are being developed and will be in place for the 2015 admission cycle.

Attend to graduate student space needs

- Departments have continued to be active in increasing the amount and quality of space dedicated for graduate student offices.

Place constraints on the number of graduate courses in which a student can simultaneously enrol

- A solution has been implemented within Quest and appears to be working well.

D. Research

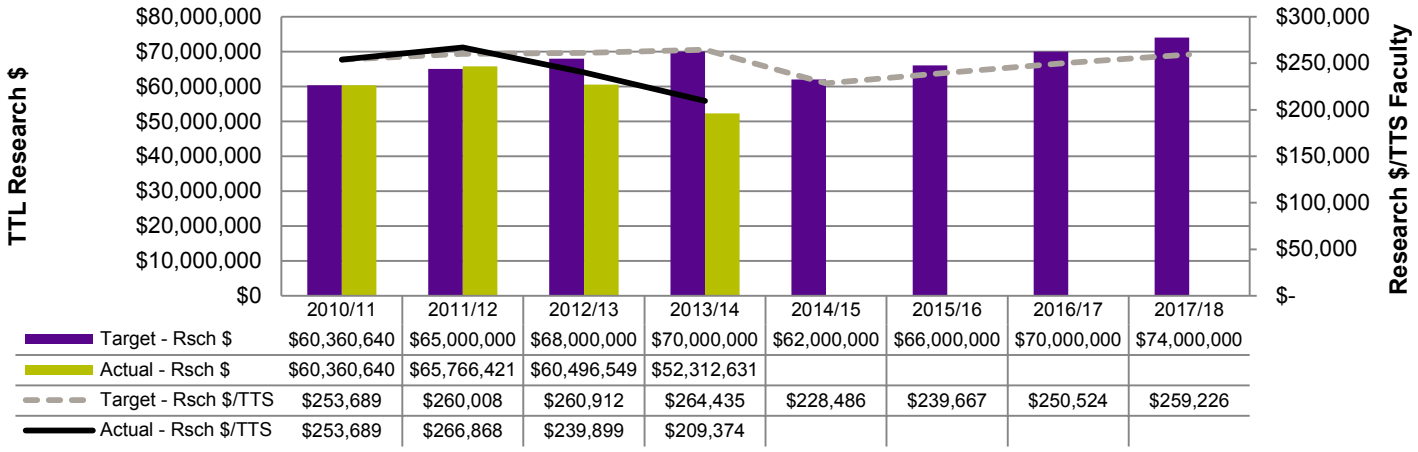
In 2013/14, the Faculty of Engineering earned $52.3 million in research funding. While this is 88% higher than a decade ago, it marks a second consecutive year of decline in total funding (see Figure 117). The deferral of a number of key provincial and non tri-agency programs have created challenges in securing funds for research and related infrastructure. From 2004/05 to 2013/14, the growth in industry funding (93%) more than doubled the rate of growth in Tri-Council funding (46%), a necessary expansion of funding sources outside of government programs.

Funding is only one measure of our research activity, and one that is largely impacted by factors outside the institution (most notably the availability of funding programs). Highlights of other research measures (detailed in Section IV.D) affirm the high quality of our researchers and their work: Waterloo Engineering has secured one new Tier I and three new Tier II Canada Research Chairs and one new NSERC Industrial Research Chair; seven faculty members have received Early Researcher Awards and two are winners of prestigious NSERC prizes; and Waterloo's scholarly contributions in journals classified as engineering or materials science has increased in recent years, both in quantity (number of publications) and quality (as measured by citations to those publications) (see Figure 125 and Figure 126).

Goal D1: Increase Research Funding

- Total research funding for the Faculty of Engineering in this reporting period was $52.3 million (see Figure 9).
- Stable funding is crucial for advancing research programs continuously. The Faculty of Engineering continues to encourage and support its researchers to pursue large multi-year partnership programs including Networks of Centres of Excellence and the NSERC Collaborative Research and Training Experience Program.
- Going forward, our research funding targets have been adjusted to take into consideration the current funding context, including the deferral of key programs such as the Ontario Research Fund and Canada Foundation for Innovation programs.

Figure 9: Research Funding Plan Performance to Target



	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Target - Rsch $	$60,360,640	$65,000,000	$68,000,000	$70,000,000	$62,000,000	$66,000,000	$70,000,000	$74,000,000
Actual - Rsch $	$60,360,640	$65,766,421	$60,496,549	$52,312,631				
Target - Rsch $/TTS	$253,689	$260,008	$260,912	$264,435	$228,486	$239,667	$250,524	$259,226
Actual - Rsch $/TTS	$253,689	$266,868	$239,899	$209,374				

Goal D2: Establish a Shared Commitment to Research Excellence

Support and motivate increased research activity

- The Engineering Research Office (ERO) proactively builds relationships with funding agencies, potential sponsors and other stakeholders to maximize the possibility of increasing research partnerships.
- Faculty members are sent research program announcements on a weekly basis to ensure they are aware of relevant opportunities.

Support the development of faculty members as researchers

- Researchers are provided the opportunity to have their grant applications reviewed by ERO staff. A new writer has been recruited to further increase the resources available to help faculty prepare stronger applications.
- Workshops have been offered to provide guidance to faculty on grant application preparation for Discovery Grant, Strategic Grant and Early Researcher Award programs.
- An internal review committee provides feedback on Research Tools and Infrastructure program applications.
- Future development efforts will focus on providing proposal-writing workshops and support to new faculty.

Develop stronger ties with industry

- The ERO routinely holds meetings with large and small companies to discuss industrial challenges that can be addressed through research, and actively collaborates with the University's Industry Liaison Officers and Centre for Career Action to raise awareness and visibility of our research strengths.
- Waterloo Engineering research is shared with broader audiences through conferences such as OCE Discovery, Waterloo Innovation Summit and Communitech Tech Leadership.
- A database of faculty members' research applications has significantly improved staff ability to identify researcher expertise that is relevant to a company's needs. A goal for the coming year is to link external-facing websites to the appropriate internal databases in order to further improve potential industry partners' ability to find relevant researchers.

Partner with a targeted set of leading global universities

- Implementation of this strategy is reported in Goal G3 of the internationalization section of this report.

Goal D3: Eliminate Barriers to Research Success

Enable a culture of collaboration and co-operation

- The Faculty of Engineering is home to a number of research institutes and centres, such as the Waterloo Centre for Automotive Research, where researchers from various disciplines collaborate.
- In our identified areas of research strength, the ERO will foster strong interdisciplinary research, collaborating with academic units to seek external partnerships and identify funding opportunities.

Improve client service

- The ERO has provided assistance for engineering researchers completing the new Common CV system. Feedback from professors who utilized this service was very positive.
- Staff in the ERO provide service directly to researchers through grant application review services, technical writing support for large initiatives, and assistance organizing site visits for major funding programs.
- Attendance at research-focused workshops and events is tracked, and participant feedback is solicited to gauge how their format, frequency or content can be improved over time.

Improve the efficacy of communications

- Weekly emails notify faculty members of potential funding opportunities, information sessions, webinars, etc.
- A priority for the coming year is to create a SharePoint site where faculty can find important forms and information for upcoming funding opportunities.

Goal D4: Celebrate Research Excellence

Recognize research excellence

- As noted in Goal A5, the Engineering Awards and Honours Committee has been meeting on a regular schedule since fall 2013 and is now professionally supported by an ERO technical writer. This new model has proven very successful, as evidenced in many significant recognitions earned in 2013/ 2014, including:
  - Prof. John McPhee has received a Tier I Canada Research Chair and, together with industry partners Toyota Motor Manufacturing and MapleSoft, received an NSERC Synergy Award for Innovation.
  - Prof. Zhou Wang was awarded the prestigious NSERC E.W.R. Steacie Award.
  - Tier II Canada Research Chairs have been awarded to Prof. Hossein Abouee Mehrizi, Prof. Sriram Narasimhan and Prof. Alex Wong.
  - Prof. Adrian Gerlich has been named the NSERC/TransCanada Industrial Research Chair in Welding.
  - Prof. Catherine Rosenberg was named a fellow of the Canadian Academy of Engineering.
  - Prof. Amir Khajepour was awarded the Professional Engineers of Ontario Engineering Medal for Research and Development.
  - Profs. Nandita Basu, Sebastian Fischmeister, Frank Gu, Dana Kulic, Sean Peterson, Christopher Wilson and Aiping Yu received Early Researcher Awards.
  - Profs. Susan Tighe and Chris Eliasmith are among the inaugural members of the Royal Society of Canada's College of New Scholars.

- Prof. Safieddin Safavi-Naeini earned the Faculty of Engineering's En-hui Yang Engineering Research Innovation Award for 2014 and the Waterloo Engineering Research Excellence Award was awarded to Profs. Bo Cui, Eihab Abdel-Rahman and Magdy Salama.

Increase public awareness of research strengths and achievements

- Waterloo Engineering research stories are being featured on institutional social media channels, including Facebook and Twitter. Our researchers have been featured in internal and external media more than 24 times in the past year. Additionally, Engineering has been contacted numerous times by national media to request comment from research experts on topical news stories.
- A number of events in 2013/14 served an important role in communicating our research:
  - The annual WE Innovate event provided an opportunity for graduate students and faculty to display their research through posters and demonstrations to local high school students and companies.
  - Researchers and industry partners were brought together at an NSERC-sponsored event on information security featuring Engineering faculty speakers.
  - Science and Engineering jointly hosted an event focused on the topic of sensors and devices, featuring several Engineering speakers and posters.
  - The Waterloo Innovation Summit included Engineering faculty speakers and several startup companies founded by our alumni.
- The ERO participates in the monthly Engineering Communications Council meeting which facilitates information sharing about events and marketing initiatives and provides an opportunity to encourage academic units and centres to promote their research.

Goal D5: Strategically Identify and Assess Research Strengths

- Over the past year, the Dean of Engineering, Associate Dean for Research, Engineering Planning Committee and ERO staff worked to identify a number of broad research themes and specific technology areas that will be used to inform our strategic research thrusts. These topics are anticipated to have significant global impact and offer many opportunities that align with Waterloo Engineering strengths. Selected themes include:
  - uniting the digital universe, with focus on 5G wireless technologies
  - machine intelligence including applications to manufacturing
  - powering economies with focus on energy storage
  - advancing the human condition through connected infrastructure, bioengineering, healthcare and water technologies
- An exercise will be undertaken within the Faculty to map researcher expertise to these areas. Opportunities to apply to major funding programs will be strategically pursued where we have a critical mass of alignment between research strengths and a program's goals.
- In order to assess our identified areas of distinguishing research excellence, metrics such as faculty research grants and chairs in related areas will be developed and tracked annually.

E. Teaching

Significant progress on our teaching goals was made throughout 2013, which marked the first complete calendar year of operation for the new teaching portfolio in the Faculty of Engineering. Notably, by the end of 2013 regular operational activities had been established and implemented in support of all four of our strategic teaching goals.

Goal E1: Enhance Support for Teaching at the Faculty Level

Develop and foster a community comprised of department representatives dedicated to teaching

- The Engineering Teaching Development Committee, comprised of representatives who champion teaching in every academic unit (except, currently, the School of Architecture), the Associate Dean, Teaching and the Assistant to the Associate Dean, Teaching, was formed and began holding regular monthly meetings in 2013.
- Initial projects for this group included:
  - developing experience in, and a template for, peer review of teaching for evaluation of new hires, for formative feedback to colleagues, and for reporting in tenure and promotion files
  - building awareness of activities and resources for teaching development in the Faculty and the University

Goal E2: Contribute to the Development of Faculty Members and TAs as Teachers

Establish minimum teaching development expectations for all new faculty members

- Since March, 2012 all appointment letters for regular faculty positions contain an explicit statement on the importance of our teaching mandate and the expectation that all new faculty will develop a plan for learning about teaching. Those without equivalent experience must complete four workshops offered by the Centre for Teaching Excellence (CTE).
- In fall 2013 the Associate Dean, Teaching started meeting with all new faculty members to review their incoming teaching background, and to discuss plans and resources for teaching development.
- A written statement of the expectations for adequate teaching in the Faculty of Engineering has been developed for use when inadequate teaching is recognized.
- In support of the 2013 annual faculty performance review process, academic unit heads were provided distributions and other aggregate data from the course evaluation scores for courses offered by their unit.

Promote opportunities for all instructors to learn more about teaching over their career

- A number of development opportunities were facilitated for, or promoted to, instructors in Engineering in 2013:
  - 8 instructors participated in the Instructional Skills Workshop (two sessions of which were facilitated or co-facilitated by the Associate Dean, Teaching)
  - 24 instructors participated in a workshop offered by the Associate Dean, Teaching on engaging student attention in large classes
  - 30 instructors participated in the annual teaching conference, Opportunities and New Directions
  - Four instructors participated in the 2013 Teaching Excellence Academy (TEA) workshop
  - Five workshops on special topics were developed and offered by the Associate Dean, Teaching in 2013; however, to focus on priority work related to Goal E1 these were discontinued in 2014
- Material was developed on the teaching criteria for tenure and promotion and how these criteria can be documented, for presentation at an informal lunch meeting for pre-tenure faculty in early 2014.
- Engineering Teaching Development community pages are maintained in LEARN to provide interested instructors access to teaching resources (76 instructors are currently enrolled in these pages).
- The TA training workshop, ExpecTAtions, was maintained and reviewed in 2013. We developed a plan with the offices for Academic Integrity, Safety, and Conflict Management & Human Rights to deliver online modules for TAs on academic integrity, ethical behaviour and safety, and tested a prototype model for a revised workshop with the First Year Office.

Provide mentorship in teaching

- Teaching mentorship is encouraged through the teaching champion in each unit and is further supported as needed by the Associate Dean, Teaching.

Goal E3: Affirm the Importance of Teaching

Include an assessment of teaching potential when hiring new faculty

- As noted in Goal E1, development of skills and tools for peer teaching assessment is a current Engineering Teaching Development Committee priority. Additionally, support has been provided directly to some departmental hiring committees through “live” training sessions.

Measure teaching quality and outcomes for individual and institutional improvement

- Work progressed throughout 2013 to maintain and improve the student course evaluation process:
  - with EngSoc representatives, streamlined the process for efficiency, reliability and use of volunteer time
  - analyzed and communicated aggregate properties of summary grades from the evaluations
  - revised the web portal to the database to ensure that users are aware of key aggregate properties (means, 85^{th} percentile and 15^{th} percentile) of the accumulated data
  - developed a standard reporting for course evaluation scores in tenure and promotion presentations, including standard aggregate properties for all courses in each unit
- In 2013 we completed a review of existing student exit surveys across the Faculty, setting the foundation for progress throughout 2014 toward implementing a Faculty-wide exit survey with a set of common questions.

Recognize and reward excellence in teaching

- The 2014 Faculty of Engineering Teaching Excellence Award was awarded to Profs. Kyle Daun, David Nairn and Luis Ricardez-Sandoval.
- The Dean of Engineering introduced a new award in 2013: the Waterloo Engineering Award for Teaching Assistantship in Architecture.
- To enhance support for nominations to the University of Waterloo Distinguished Teaching Award, the engineering teaching portfolio:
  - developed a set of links and useful materials, including a sample nomination package
  - liaised with CTE to ensure that nomination expectations are well known
  - launched a web portal for student recognition of teaching excellence

Communicate commitment to the Faculty's teaching mandate

- In addition to the outreach and expectation initiatives reported above, the engineering teaching portfolio also continued to develop the Faculty of Engineering teaching web site to publicize our teaching mandate.

Goal E4: Support Teaching Innovations and Strategies for Integrating Learning

Introduce an innovative undergraduate learning environment for all engineering students

- A foundational element of the space plan for our proposed new Engineering 7 (E7) building is the Engineering Ideas Clinic™, an open-concept learning facility designed to support the integration of learning and to extend experiential learning beyond co-op into each academic term. Instructors from all 13 engineering programs will collaborate to develop and deliver multi-disciplinary hands-on clinic modules that will be a core part of the curriculum for every Waterloo Engineering student, beginning from the first year.
- A multi-department Engineering Ideas Clinic™ Committee, co-chaired by Prof. Sanjeev Bedi and Prof. Vincent Gaudet, was struck in fall 2013. Over the past year the committee has:
  - developed floor plans and detailed facility specifications for the E7 space plan
  - developed several clinic-based activities to be introduced as pilots in fall 2014
  - contributed to the development of plans for extension of the student machine shop (see Goal H3).
- The committee's goal is for each program to develop an activity and offer it for use by other programs by September, 2015. This will provide a pool from which each program can select activities to conduct with their students.
- In the coming year, the Associate Dean, Teaching will work with the Associate Dean, Co-operative Education and Professional Affairs to help the incoming group of graduate attributes lecturers develop methods and tools for assessing the contributions of the new Engineering Ideas Clinic™ program components.

Support teaching innovations and curriculum renewal

- The Associate Dean, Teaching made presentations to the Engineering Planning Committee and to Senate aimed at sharing knowledge on the challenges and potential of deep and integrative learning.
- The Dean continued to support the CTE seminar series on integrative learning in Engineering in 2013.

F. Outreach

Throughout 2013/14, the Engineering Outreach Office has continued to make progress toward increasing interest in STEM subjects among youth. Progress on high school student programming continued to outperform our initial targets, such that we have chosen to increase these (see Figure 10) for the remainder of the plan period.

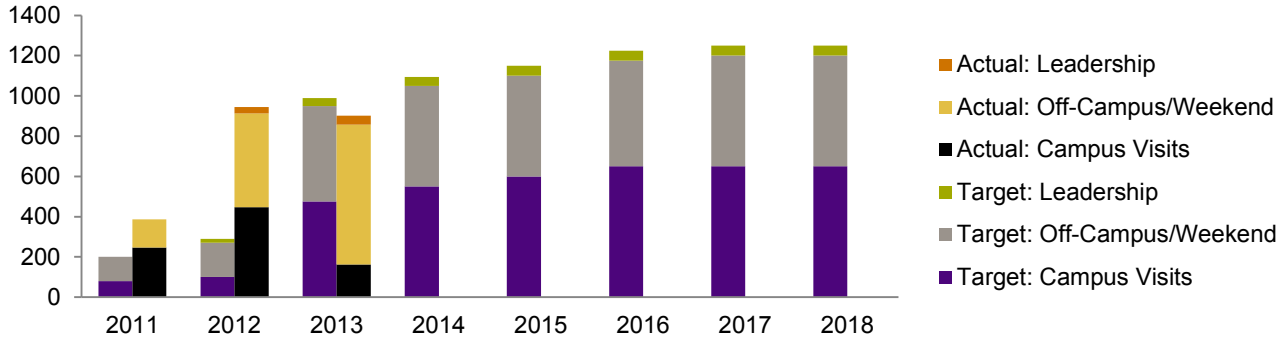
Goal F1: Expand the Scope of Waterloo Engineering Outreach Programs

Expand outreach activities to include high school programming

- High school workshop programming continues to grow as champions and contacts are found. The current model of offering one complimentary visit to the school and charging transportation costs after has proven successful.

- On-campus activity decreased in the past year, due to a change in how the Designing the Future event was operated and because we were not invited to run a supplementary activity for the Walter Bean Lecture. In the coming year we will work to enhance promotion of the Designing the Future event through local school boards and will work more closely with the Engineering Research Office on their WE-Innovate event.
- High school program targets were increased in 2013 due to the strong performance experienced to date.

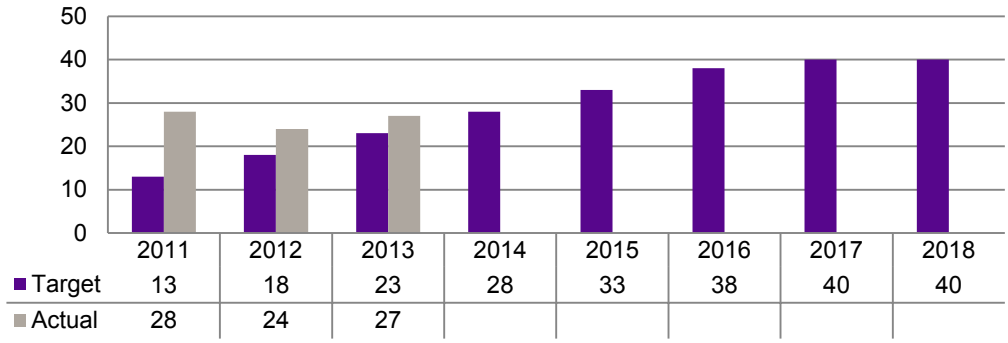
Figure 10: High School Outreach Program Participation Performance to Target



Increase the breadth of Kitchener-Waterloo school engagement

- ESQ workshop bookings continue to be strong, and it is expected that re-opening communication with schools and finding new local champions will facilitate expansion into more unique schools.

Figure 11: ESQ Workshop Participation Performance to Target



Goal F2: Enhance the Waterloo Engineering Community through Participation in Outreach

Engage current Waterloo Engineering community members in outreach activities

- Identifying staff and faculty to participate in outreach events remains a significant priority.
- In the coming year, a clear definition of engagement will be developed to help guide engagement initiatives and the measurement of such participation.

Promote opportunities to participate in outreach initiatives to faculty members

- Currently we engage a small number of faculty multiple times a year to give guest lectures. To expand this participation, a plan must be developed to better promote related opportunities to faculty.
- Depending on demand, interest and barriers, some outreach programming might need to be developed or modified to better match these community members' ability to participate.

Diversity

Section IV.E of this report provides information about the current representation of women in our engineering programs and in the School of Architecture.

The Women in Engineering Committee and Engineering Outreach Office progressed on our Vision 2015 goals related to diversity in 2013/14, with notable progress toward increasing the participation of women in engineering at Waterloo including new programming and confirmation rates that meet our established targets.

Goal F3: Increase the Participation of Women in Engineering at Waterloo

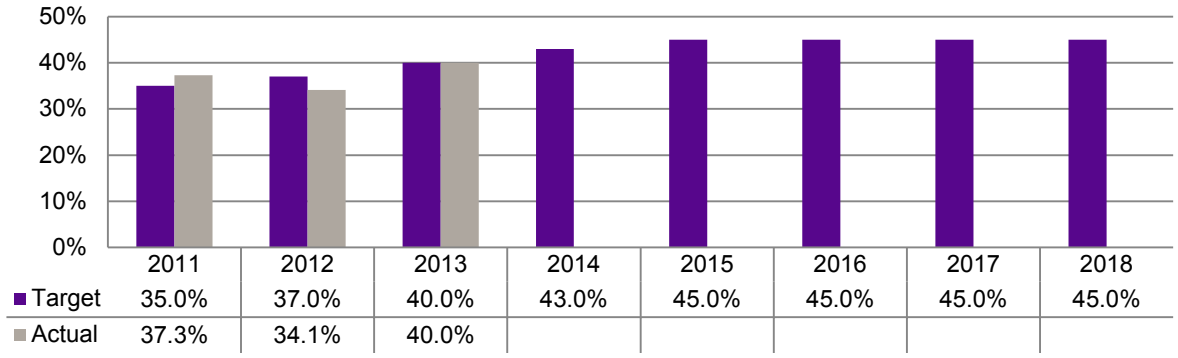
Enhance programming to get girls and women excited about science and engineering

- New programs this year included: expansion of the girls club program, launch of a Women in Engineering website; and a "What's Next" career conference for female undergraduate and graduate students.
- In partnership with the Waterloo Business and Education Partnership we initiated a program to expose youth to entrepreneurship in engineering, especially young women: E3 (Engaging in Engineering & Entrepreneurship), a week-long camp for high school females entering grades 10-11 interested in learning the basics of entrepreneurship through an engineering lens, was offered on campus in August.
- Support was secured from the Google Kitchener office to offer Catalyst Codemakers. This new year-long program to introduce grade 10 females to software engineering and computer science will run in 2014/15.

Increase the confirmation rates of offers made to female undergraduate engineering applicants

- As seen in Figure 12, confirmation rates for female undergraduate engineering students have risen and are on target. Significant progress has been made in the overall ratio of female to male engineering students. Preliminary data predicts the first-year engineering class starting in fall 2014 will be 27% female, the highest in our history.
- We continue to host two targeted events a year for female prospective students who have received an offer of admission from Waterloo Engineering.

Figure 12: Female Engineering Undergraduate Confirmation Rate Performance to Target



	2011	2012	2013	2014	2015	2016	2017	2018
Target	35.0%	37.0%	40.0%	43.0%	45.0%	45.0%	45.0%	45.0%
Actual	37.3%	34.1%	40.0%					

Establish best practices related to the recruitment of women faculty

- The Civil and Environmental Engineering Department has established a proactive process for each faculty search committee to connect with the Associate Dean, Outreach for assistance in recruiting women faculty. However, there is still no Faculty-wide mechanism in place to ensure such connections are made when search committees are formed in other departments.
- A University-wide equitable recruitment strategy is currently under development.

Develop a better understanding of the experience of women in engineering at Waterloo

- Planning is underway to work with internal and external groups to gather information on the experience of our female engineering students, using varied strategies to ensure the information collected is representative.
- In the coming year we will investigate other metrics such as continuation rates to develop a better understanding of female engineering students' academic success.

Goal F4: Build an Inclusive Atmosphere within Waterloo Engineering

Establish a framework to report and respond to issues of diversity and inclusivity

- The Outreach Office is currently in discussion with the new University Diversity Director, Mahejabeen Ebrahim, to identify best ways to report and respond to issues on diversity.
- A pilot initiative this year will see Ebrahim working with first-year mechanical engineering students in their concepts course to discuss diversity and examine ways to integrate this into the curriculum. If this program is successful we hope to move into other engineering programs, with an initial focus primarily on the programs with lowest female enrolment.

G. Internationalization

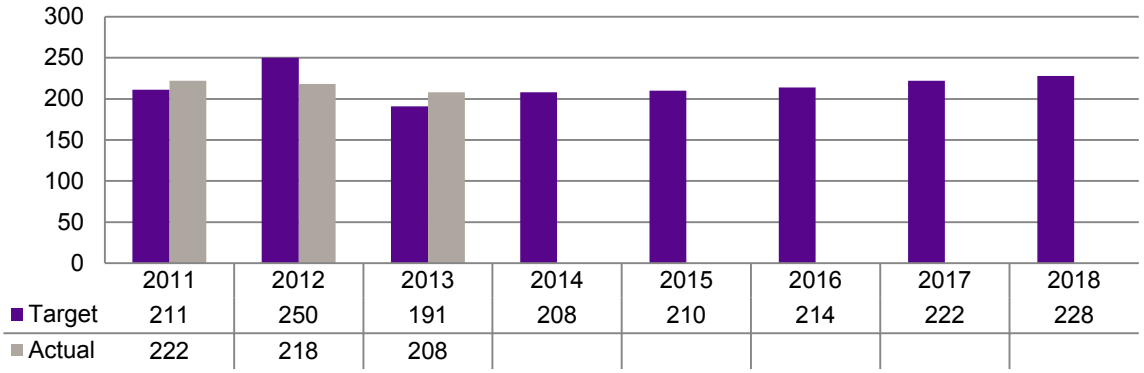
Strategic internationalization remains a key priority area across Waterloo Engineering, from the globalization of our undergraduate experience to the development of strategic academic and research partnerships with select institutions globally. Section IV.F of this report provides some metrics related to internationalization in Engineering.

To consolidate and enhance our internationalization programs, a new Associate Dean, International portfolio was established effective July 1, 2014.

Goal G1: Increase International Undergraduate Enrolments

- International undergraduate student intake targets were reduced following the closure of Waterloo's UAE campus in 2012, but will ramp up again in the coming years as overall undergraduate enrolment targets increase due to the expansion plans outlined in the undergraduate studies section of this report.
- By 2018, the targeted international proportion of our first-year class will be the same as our 2013 actuals, at approximately 13%.
- In fall 2013 our international undergraduate student intake was slightly lower than the past two years (largely due to the UAE campus programs ending), but exceeded target by 9%.

Figure 13: International Undergraduate Student Intake Plan Performance to Target



	2011	2012	2013	2014	2015	2016	2017	2018
Target	211	250	191	208	210	214	222	228
Actual	222	218	208					

Enhance international recruitment efforts

- The recruitment of highly qualified and committed candidates must continue to be emphasized to strengthen our applicant base for the future.
- Visa student applications continue to increase; however, the visa student pool has a lower yield on applications than the domestic pool, with attrition occurring even after offers are accepted. Further, there are higher rates of ineligible (typically due to insufficient English language skills) and incomplete applications in the visa pool.
- Efforts continue to leverage faculty member networks and expertise to complement existing international recruitment sessions with outreach sessions.
- Strategic market selection identifies strong existing areas and potential emerging regions with untapped potential and/or resources that might be leveraged. Recruitment activities and applicant numbers are tracked for these areas regularly to assess and adjust efforts as required.

Goal G2: Increase International Experience Opportunities for Undergraduates

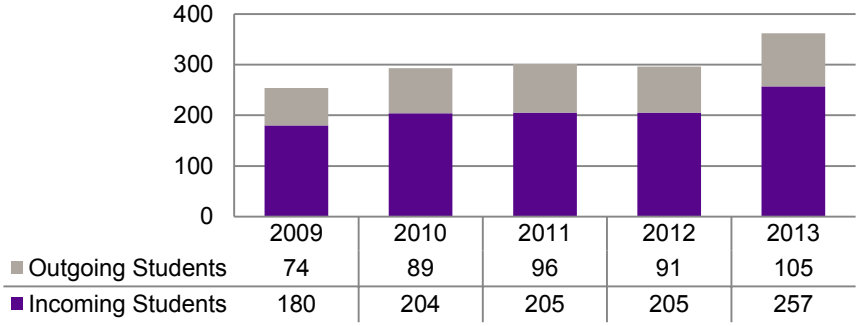
Increase participation in international exchange

- Undergraduate participation in international exchange programs for outgoing Waterloo Engineering students increased in 2013, reaching 105 students (over 40% more than participated in 2009).
- Many changes were made in 2013, as the Engineering Exchange Office worked to implement process improvements and Waterloo International made changes at the University level. Among the most significant changes:
  - The application process continues to evolve toward an online system including electronic submission and approvals with a focus on ensuring that exchange students will earn full credit for courses taken on their

return to campus. The implications of this shift on our professional accreditation must be thoroughly considered.

- Waterloo International has modified exchange agreements with two German institutions to include a “home fee” arrangement, effectively increasing the costs for outgoing students. It is anticipated that this will negatively impact exchange numbers in coming years.

Figure 14: Undergraduate International Exchange Participation

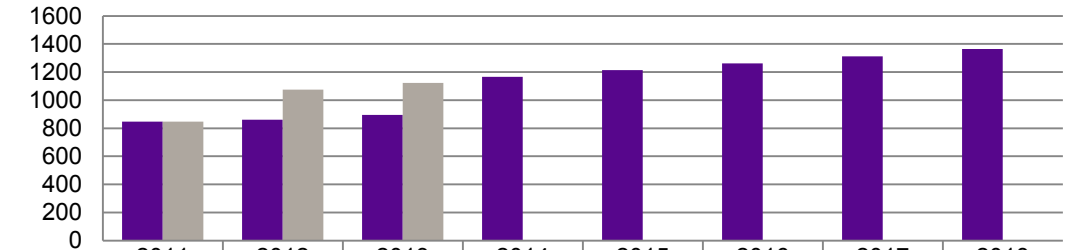


	2009	2010	2011	2012	2013
Outgoing Students	74	89	96	91	105
Incoming Students	180	204	205	205	257

Develop additional international co-op work term opportunities

- As noted in the co-operative education section of this report, the number of international jobs substantially exceeded target in the past two years. Targets have been revised upwards to ensure our future aspirations are for continued growth.

Figure 15: International Co-op Work Terms Performance to Target



	2011	2012	2013	2014	2015	2016	2017	2018
Target	847	860	895	1167	1214	1262	1313	1365
Actual	847	1074	1122					

Goal G3: Increase International Graduate Studies and Research Collaborations

Develop an international research strategy and pursue strategic internationalization in graduate studies

- Progress was made toward building and nurturing strategic relationships, aligned with our areas of research strength, with a targeted set of top-ranked global institutions:
- Engineering faculty members took part in a three-day workshop with the University of Bordeaux, including participation in workshops on nanotechnology and functional materials, water, energy and bioengineering.
- Interaction between Karlsruhe Institute of Technology and Waterloo Engineering increased through reciprocal visits by senior administration. Areas where each institution has significant expertise were identified as energy, automotive, embedded systems, material science and printed and flexible optoelectronic systems.
- Additional strategic partnership opportunities for graduate students and researchers are being explored with UC Berkeley, Nanyang Technological University in Singapore, Hong Kong University of Science and Technology, and the Georgia Institute of Technology in Metz, France.

Establish an international office in the Faculty of Engineering

- To consolidate and enhance international activities across the Faculty, we have established the new role of Associate Dean, International. Professor Rick Culham became the inaugural associate dean on July 1, 2014.
- An international office is being established, comprised of the Associate Dean, an administrative support staff person, and the existing undergraduate exchange office.

- Priorities over the coming year will include assuming responsibility for engineering undergraduate exchange operations, working toward the development of support systems for international students, and establishing mechanisms to nurture and build strategic academic and research partnerships with a targeted group of top-ranked global institutions.

Goal G4: Pursue Targeted Collaboration Initiatives in India

- As a key participant of the Pan-IIT Conference held in Toronto in June, the Dean of Engineering Office hosted several heads of the Indian Institute of Technology (IIT) schools. The Dean's office also supported the development of the first Pan-IIT Entrepreneurship Pitch Event at the Conference.
- The Chief Technology Officer of TCS (Tata Consultancy Services) visited the Faculty to explore mechanisms for research collaborations.

H. Entrepreneurship

The University of Waterloo is intensely entrepreneurial by nature and Waterloo Engineering is dedicated to helping students test new ideas and build businesses that will thrive in today's global economy. We made significant progress throughout 2013/14 toward our strategic goals to further develop and enhance our entrepreneurial ecosystem.

Goal H1: Enhance Existing Supports for Entrepreneurship and Innovation

Transition the Conrad Business, Entrepreneurship and Technology Centre (Conrad) to a school in the Faculty

- Conrad anticipates making progress toward this goal in the coming year.

Expand and enhance the Enterprise Co-op (E Co-op) program

- Conrad is currently mandated to run the E Co-op program for the University, and this year will provide a mid-mandate report to its stakeholders.
- E Co-op is a key component of one stream of the new entrepreneurship option offered to engineering students (described below).

Ensure all engineering programs include a capstone design project

- All engineering programs now include a capstone design project. Support for capstone projects has been enhanced through the introduction of various awards, described under Goal H2.

Goal H2: Introduce New Initiatives to Foster Entrepreneurial Activity and Innovation

Develop a formal opportunity to expose select engineering students to entrepreneurship during their first work term

- The Bridging Entrepreneurs to Students (BETS) co-op program supports seed and early-stage startup companies who would not otherwise have the financial resources to hire full-time staff or co-op students by pairing them with University of Waterloo students on their first co-op work term. Students receive one week of workplace skills training and then work in three five-week placements with startups.
- While initial offerings of BETS were constrained to startups in the Waterloo Region, this year there were some placements with startups in the Greater Toronto Area.
- BETS has developed into an important contributor to our entrepreneurship ecosystem: Participating startups benefit from talented "first employees" and the learning involved in managing others, and BETS students gain valuable experience in entrepreneurial environments and greater competence as employees, which assists them in securing employment during their next work term.

Seek formal collaboration initiatives to connect Conrad students with other engineering students and faculty

- Conrad faculty provide support for the administration and adjudication of various new entrepreneurship awards for engineering students, most notably the Normal Esch Entrepreneurship Awards for Capstone Design.

Pilot competitive business plan awards for capstone projects

- Currently seven different award programs have been developed with external support to encourage and reward student entrepreneurship as demonstrated through capstone design projects.
- With donor support, Waterloo Engineering has established the Engineer of the Future Trust, the first in Canada to provide discretionary micro-seed funding for student entrepreneurs.

- In the past year, over $820,000 has been raised to support engineering capstone and entrepreneurship awards and pitch competitions and to launch the Engineer of the Future Trust.

Introduce a Graduate Diploma in Business and Entrepreneurship

- Conrad is now offering six courses a year toward this diploma. The courses have been well received, and have typically filled in each term.
- Enrolments in these courses are dominated by students pursuing a Certificate in Business and Entrepreneurship (rather than the stand-alone diploma) as part of their studies in a professional master program elsewhere in the Faculty of Engineering.

Launch an undergraduate option in entrepreneurship

- Conrad launched an entrepreneurship option in September, 2014 that is available to all interested Waterloo Engineering undergraduates.
- Making a minor in entrepreneurship available to all undergraduates on campus has become a priority for Conrad, and is central to the University's emerging entrepreneurship strategic priorities.

Goal H3: Develop New Spaces and Infrastructure to Support Entrepreneurship and Innovation

Embed the facilitation of entrepreneurship in the design of E7

- Major facilities in support of student entrepreneurship and innovation are incorporated into the space plans for Engineering 7, including:
  - the Engineering Ideas Clinic™ where students will design, build, test and refine ideas in a series of multidisciplinary modules that inspire creativity, inquiry, ideas generation and interest in entrepreneurship (see Goal E4)
  - departmental "garages," which will provide enhanced facilities for students to work on capstone design projects
  - a multimedia pitch area for honing presentations and pitching new ventures
  - a main-campus home for Conrad, where students can take advantage of programs including E Co-op, MBET and the undergraduate option in entrepreneurship

Strengthen campus opportunities to build-test hardware devices and prototypes

- Through the recently-established Alumni Entrepreneurship Support Program, new alumni who are developing an idea for a potential future business will have access to the student machine shop, 3D printing service, device and circuit fabrication and characterization facilities and — as of 2015 — a surface mounting fabrication facility.
- Renovated space in ECH will also be available to new graduates who need to further refine their capstone prototypes and develop their businesses.
- Space has been allocated in East Campus Hall to accommodate an extension of the E5 WEEF Student Shop to provide much-needed additional capacity for students to complete their projects. This additional shop space, which is expected to be operational in early 2015, will alleviate demand on the current space that is resulting in unacceptable wait times for students to use some equipment.

I. Space

Waterloo Engineering space holdings have increased by 19,046 nasm (52%) over the past eight years, to reach 55,613 nasm (see Figure 139). While this is a significant achievement, space limitations remain the most pressing constraint to the achievement of many of our plan goals. Space and facilities are also essential supporting elements to many of our strategic goals, from research enhancement to the facilitation of entrepreneurship to innovation in teaching and learning. While we continue to move forward with our current space plans, we note that the availability of funding would be very helpful to accelerate them.

Goal I1: Complete a Comprehensive Update to the Existing Space Plan

- The current space plan for Waterloo Engineering focuses on providing space required by the departments participating in the new undergraduate program in biomedical engineering and the expansion to a second stream of mechatronics engineering.

- The space plan has also been updated to reallocate space within the Faculty as a result of the closure of the University's UAE campus (which resulted in the cancellation of growth plans in Chemical Engineering and Civil & Environmental Engineering). This ongoing initiative is expected to continue through to mid-2015.
- An emerging space opportunity for Engineering exists as a result of a proposal made to the University in May, 2014 to acquire space within the recently acquired Blackberry Buildings. At this time the Faculty is in discussion with the University for at least one floor of EC4 (previously referred to as BB4).

Goal I2: Create the Space Required to Meet Operational and Strategic Needs

- Our priority space goal remains the construction of Engineering 7 (E7). A space plan has been completed and significant funds raised. Approval was granted by the University Board of Governors on October 28, 2014 leading to planned ground breaking before November, 2015 and full occupancy in September, 2018.
  - As described in Goal H3 of the entrepreneurship section, E7 and adjacent space in East Campus Hall will provide space and infrastructure that will nurture student entrepreneurship and innovation.
  - To help achieve the Faculty's strategic goal related to facilitating innovative teaching approaches and the integration of learning (see Goal E4), a 13,200-square-foot Engineering Ideas Clinic™ will be located in E7. Here students will design, build, test and refine ideas in a series of multidisciplinary modules that integrate classroom theory with hands-on learning.
- We are currently working to add at least a floor of EC4 to our space inventory to address the critical space needs of Systems Design Engineering and Mechanical & Mechatronics Engineering.
- It is also planned, given our very serious space shortfall, to investigate the feasibility of erecting a single-floor steel structure above suitable sections of E3. Such a light-weight structure could be used to provide graduate offices for students engaged in the laboratories of E2 and E3 and potential design studio space should the proposed new architectural engineering program (described in the Civil & Environmental Engineering report in Section III.L) move forward.
- A longer-term space objective is to finalize the reconsolidation of Chemical Engineering onto the East Campus, which requires E8 (the extension of E6, which opened in 2012) to be planned and constructed.
- A second long-term objective is the vision for E9 to be located, potentially, immediately north of E7; this project is a long way into the future but provision is being made in E7 for accommodate a potential future overhead link into E9.

Goal I3: Harmonize all Aspects of Safety within the Faculty of Engineering

- The Engineering Safety Planning Committee (ESPC) expanded its membership to include representatives from the six departments located on main campus, as well as the Dean's Office. Efforts are underway to identify and include a representative from the School of Architecture.
- The ESPC has concluded its analysis of potential methods for safe access to Engineering buildings and labs, with a resulting recommendation that WATCARD access would be the superior method. The next steps in this project will involve presenting this recommendation, initially to the Dean, for further review and consideration.
- Meetings with the University Information Systems and Technology office regarding the development of a safety training database interface have been very productive, with a draft version for beta testing expected in fall 2014.
- Chemical Engineering and Mechanical & Mechatronics Engineering have completed a hazard analysis and developed a first round of Standard Operating Procedures (SOPs). This initiative is progressing in the other departments with completion expected in winter 2015. A SharePoint site is in place for departments to share completed SOPs.
- A new safety focus for departments with facilities in the Mike & Ophelia Lazaridis Quantum-Nano Centre (QNC) is a University-level committee struck in 2014 to focus on the QNC labs and development of a campus-wide resource on the safe handling of nano-powders.

J. Information Technology

In 2013/14, Engineering Computing continued to ensure a quality computing environment for students, staff, and faculty. The upgrade and/or renovation of undergraduate labs is ahead of schedule. Client support continues to be a priority for the unit. In 2013/14, six projects have been advanced and sufficiently completed to support improvements to operational efficiency and innovation in service delivery for all units in Engineering and across the University.

Goal J1: Ensure a Quality Computing Environment

- Undergraduate computer labs and terminal servers are upgraded and/or renovated on a rotating basis following a regular schedule to ensure a quality computing environment for our students. In 2013/14 the Fulcrum (22 stations), Pulley (24 stations), and Lever (42 stations) labs were upgraded. Next labs scheduled for upgrade include Wheel (20 stations, upgraded September 2014) and WEEF (140 stations).
- In fall 2013 a dedicated computer lab for professional master's students was opened. These students, who previously did not have on-campus access to dedicated computing resources, now have access to a lab with 25 desktop and nine laptop computing stations and space for collaborative work and project meetings.
- The digital signage used to communicate computing environment operating status is being upgraded to allow more cost effective operation and a larger number of units with the potential to communicate a wider range of items.

Goal J2: Enhance Support to Computing Clients

- In 2013 two additional part-time staff members were hired to increase the IT Service Desk hours to 10 a.m. – 4 p.m. Monday to Friday. This support level has been maintained throughout 2013/2014.
- The IT service phone line continues to provide a single point of contact through which faculty and staff support requests are routed to the individual(s) best placed to respond.

Goal J3: Support Improvements to Operational Efficiency and Innovation in Service Delivery

- The Associate Dean, Computing continues to implement a process by which inefficient or ineffective operations and duplication of efforts are identified by Engineering Computing staff and solutions are developed, either by adapting and sharing existing systems or by implementing new systems. Among such innovations:

- ECResearch, a fileserver that provides secure, cost-effective and scalable disk space for researchers needing to back up large amounts of data has been implemented. Over 60 faculty research groups use this facility.
- The functionality of the Online Faculty Information System has been further developed to assist faculty with the creation of their Common CV.
- Documint, a searchable document management system, was developed and implemented for the Canadian Engineering Accreditation Board external reviewers' visit in fall 2013. Further uses for this system are being explored.
- Surveyor, an online survey tool for use on devices capable of accessing the Internet, has been developed and was made available in a beta release in winter 2014.
- The Faculty Appointment Tool, a SharePoint system for tracking academic appointments, continues to be enhanced and used extensively by staff in the Dean of Engineering Office. In 2013/14 it was rolled out as an information resource to select staff in all eight academic units and piloted for data input in two departments.
- Trak/AUDIT, an asset management system, is now being used by all Faculties except Environment. In 2014/15 its further development and use at the institutional level will be investigated by an IST team.

K. Advancement

We have made significant progress to support Vision 2015 by enhancing the Faculty's reputation as a world-class leader in engineering research and education, and by securing the philanthropic support required for our priority initiatives.

Goal K1: Secure the Philanthropic Support Required for our Priority Initiatives

Close the gap in the Vision 2010 Campaign, with a focus on infrastructure funding

- The Vision 2010 campaign has currently achieved 109% of its $120 million fundraising goal (see Figure 138) and the Faculty has progressed into the Educating the Engineer of the Future Campaign.

Develop and execute a fundraising strategy for Vision 2015 priorities, in particular as they relate to capital needs and graduate fellowships

- In an effort to move forward from the Vision 2010 brand for the Faculty fundraising campaign as well as incorporate the Vision 2015 fundraising priorities we extended the Vision 2010 campaign goal and we are in the process of re-branding as the Educating the Engineer of the Future Campaign.

- The expanded campaign is currently in the quiet phase. As a result of our early success in fundraising for the new E7 building, we are expanding the scope of the campaign to include additional strategic objectives including graduate scholarships and student experience initiatives. We are currently planning an additional goal of $70M with an end date set to coincide with the opening of the E7 building in 2018.

Maintain Faculty-level fundraising while supporting departmental priorities through enhanced annual fund initiatives and goals

- Waterloo Engineering is donor-centric in its fundraising approach, working with our donors to match their philanthropic interests in Engineering with our broad range of programs, student needs and projects. During the past year, financial and in-kind support has been raised to support departmental needs through undesignated donations to program support and equipment as well as targeted donor gifts to, for example: support from Toyota Canada for graduate scholarships in automotive safety; memorial scholarships and fundraising initiatives in Civil & Environmental Engineering, Architecture, and Chemical Engineering; an undergraduate scholarship in honour of Rick Haldenby's 25 years as Director of the School of Architecture; contributions to the Engineer of the Future Trust; and support for capstone design initiatives.

Engage our alumni at a higher level by offering strategic engagement opportunities based on their interests and capacity

- The restructuring and evaluation of the alumni affairs program initiated in 2011 continued this year as we shift from a broad-based event model to a plan that includes more strategic events focused on our key geographic areas (Waterloo, GTA, Ottawa, Calgary and San Francisco/Bay area). In 2013, 18 alumni events were organized by Waterloo Engineering's Advancement Office, reaching a total of 5,597 alumni.

Goal K2: Enhance the Faculty's Reputation as a World-class Leader in Engineering Research and Education

Strengthen the Faculty brand through consistent messaging and visual identity

- The foundation for success in external communications is the brand: a shared understanding of who we are and how we tell our story, supported by a positioning statement, key messages, a clear visual ID, strategic marketing and strong stakeholder engagement. During the past year, a significant initiative was undertaken to define and develop key messaging for the Educating the Engineer of the Future Campaign – a campaign that will support significant fundraising, engage pride in our alumni and strengthen Waterloo Engineering's reputation.

Expand Waterloo Engineering's profile as a world-class school of engineering

- Our reputation as a leader in engineering education and research was enhanced in the past year with exceptional media coverage, including an article in Bloomberg BusinessWeek that called the University of Waterloo "Canada's Stanford" and a Business Insider article that described Waterloo Engineering as the #1 engineering school in Canada.
- Interviews with high-profile entrepreneurs such as Alexis Ohanian, co-founder of reddit, who praised Waterloo Engineering and its entrepreneurial environment, served to elevate our profile and strengthen our brand and marketing and communications materials.

Improve all web sites and introduce new electronic and social media strategies

- During the past year, considerable progress was made with the migration of the Faculty's expansive web site to the new Drupal platform. In addition, a concerted effort was made to increase the Faculty's reputation and awareness through greater content marketing, specifically the more strategic use of social media and video.

Develop and implement a strategic graduate student recruitment program

- Progress, while challenging, continues to be made in the area of graduate recruitment. An engineering graduate studies marketing and recruitment plan was implemented, building on the learnings and successes of the previous year. Preparation of the updated plan included a basic competitive and market analysis. New initiatives included: the implementation of a national engineering graduate studies consortium; a research awareness campaign including social media, advertising digitally and on the TTC; and improved communications with prospective students through brochures, call campaigns, and confirmation mailings.

Support efforts to create an engaging and inclusive environment for current students

- The Engineering Ambassador Team grew from 82 to 117 students and over 150 trained faculty members actively volunteered for undergraduate recruitment events.

Lead efforts to keep faculty and staff informed of key initiatives and achievements

- The Engineering Communications Council reconvened in late 2013. Held monthly, the meetings are attended by staff and faculty representatives from across Engineering and include the maintenance and distribution of editorial and events calendars.
- An audit of our internal and external communications took place in 2014, including an Eng-e-News-focused survey sent to staff and faculty.

Support Vision 2015 development and alumni objectives with best-in-class marketing communications

- During the past year, three foundational documents were created in preparation for the Educating the Engineer of the Future campaign and the related marketing and fundraising activities. These included: the case for support; a campaign plan for fundraising; and the campaign communications plan. The overall strategy for the campaign has been continually refined over the past year as key elements have been tested for relevancy and impact with our stakeholder audiences.

L. Academic Unit Progress Report Summaries

This section presents a summary of each of the annual Vision 2015 progress reports developed by our academic units. These reflect progress on the goals and targets outlined in their implementation plans, which were included as an appendix to the original Vision 2015 plan.

School of Architecture

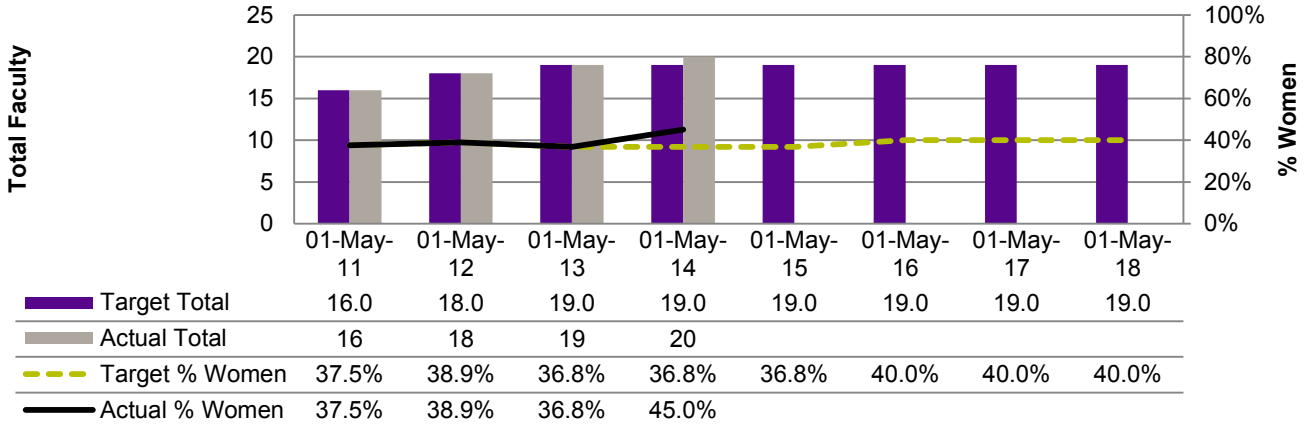
Ila Berman, O'Donovan Director

The School of Architecture has been undergoing an internal planning process, and, as part of this process, has undertaken an environmental scan of aspirant peer programs and a full internal assessment of the School's undergraduate and graduate curricula, policies, resources and culture. This process is intended to not only develop long-term initiatives for the School and its programs, but also ensure that any future program modifications respond both to the CACB Accreditation Focus Evaluation (2013) and the MArch OCGS External Reviewers Report (2013) and are consistent with the University of Waterloo's strategic plan and the Faculty of Engineering Vision 2015 plan.

A. FACULTY AND STAFF PLAN

- At the end of 2013, Director Rick Haldenby stepped down after a term of 26 years. The new Director, Ila Berman, began her term in January, 2014 and has embarked on a number of initiatives for the renewal, expansion and development of the School moving forward.
- Subject to approval of a new program to be proposed in Integrated Design (see Section G) and related resource planning, projected increases in faculty are primarily in relation to areas of growth (digital design technologies: fabrication, parametric design, interaction, advanced visualization; and urban design/landscape) and the development of the new program.
- In order to expand expertise and increase the draw of the graduate programs, the School will also focus on bringing in one to two prominent visiting faculty each year as well as additional definite-term appointments.

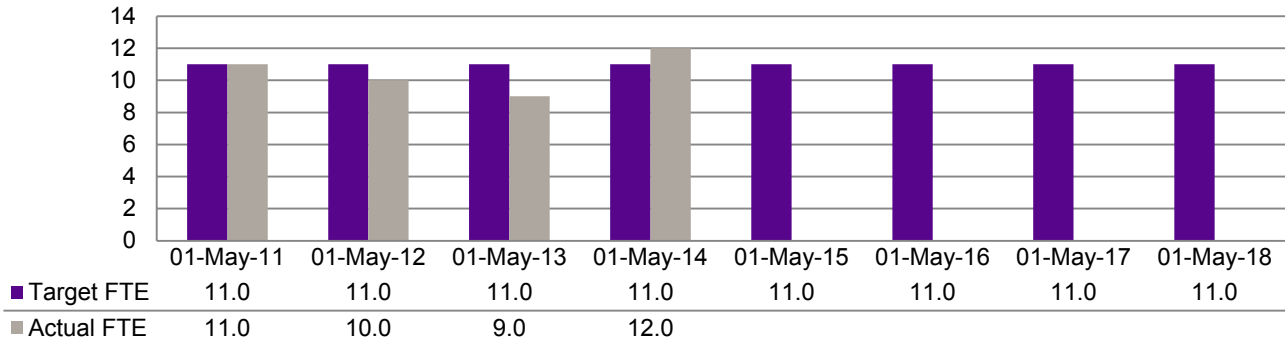
Figure 16: ARCH Regular Faculty Complement Plan Performance to Target



	01-May-11	01-May-12	01-May-13	01-May-14	01-May-15	01-May-16	01-May-17	01-May-18
Target Total	16.0	18.0	19.0	19.0	19.0	19.0	19.0	19.0
Actual Total	16	18	19	20				
Target % Women	37.5%	38.9%	36.8%	36.8%	36.8%	40.0%	40.0%	40.0%
Actual % Women	37.5%	38.9%	36.8%	45.0%				

- In 2013/14 the School hired a new Client Services Officer for Architecture Computing and Media, who supports the computing and technical needs of students and faculty members as well as managing the operation of the School's website. A new non-regular Resource and Administrative Assistant to the Director was also recently hired to provide administrative assistance to the Administrative Officer and Academic Administrative manager, and to support the Director in relation to external affairs.
- Future staff increases are projected in relation to the new program to be proposed in Integrated Design (see Section G).

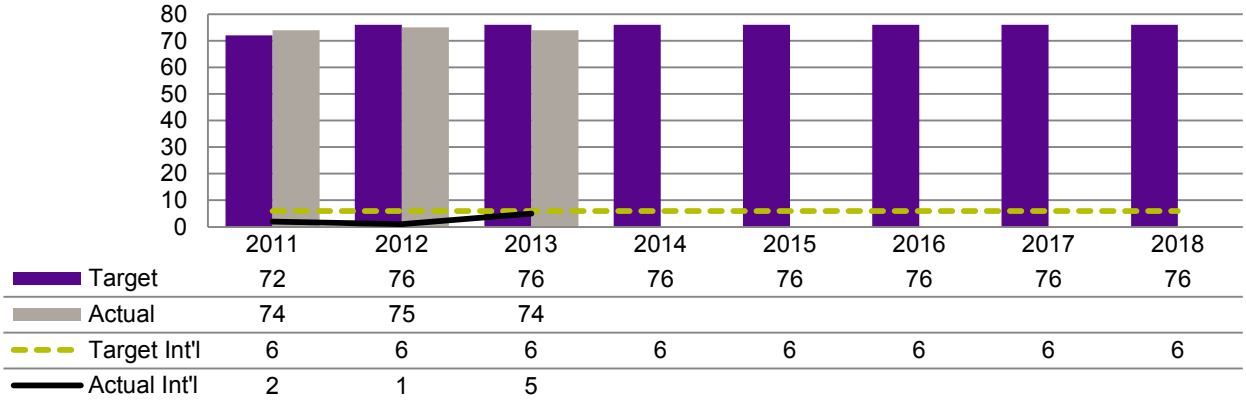
Figure 17: ARCH Staff Complement Plan Performance to Target



B. UNDERGRADUATE STUDIES PLAN

The strategic planning and curricular review process over the past year has led to a series of proposed modifications to the BAS program to strengthen the structure of, alignment and integration of coursework within the program, to augment coursework in disciplinary areas that are currently lacking, and to improve the transition between the BAS and MArch programs to better prepare students for graduate study given that the MArch is the first professional degree to which the BAS leads. These modifications are consistent with three elements of the University's strategic plan 2013-17, namely: research excellence and impact, educational quality, and student opportunities. These changes were approved by the School of Architecture on September 18 and 22, 2014 and are going through the university approval process (fall 2014) for implementation in fall 2015.

Figure 18: ARCH Undergraduate Intake Plan Performance to Target



Objectives:

- To maintain the strength of the undergraduate core curriculum, yet eliminate redundancies or disconnects within the curriculum, while enabling more flexibility and more opportunities for advanced research at the upper levels both to better prepare our undergraduate students for thesis, and enable a smoother transition into the grad program, while also expanding opportunities for faculty development by bringing faculty work and research into the curriculum. The expansion of upper-level electives will also enable faculty to cover a broader range of topics that address critical issues in relation to the discipline of architecture and the future of architectural education.
- To supplement the existing curriculum in areas that have been less developed within the core curriculum, and to expand our capacity in areas such as digital design technologies, architectural analysis and research methodologies (in support of thesis), and urbanism, landscape and ecology.
- To provide expanded opportunities for global study abroad in addition to the Rome program both for undergraduate and graduate students.
- To ensure that the undergraduate program is geared toward retaining our students and encouraging them to continue to the graduate program so that they are completing their first professional degree (MArch) at Waterloo.

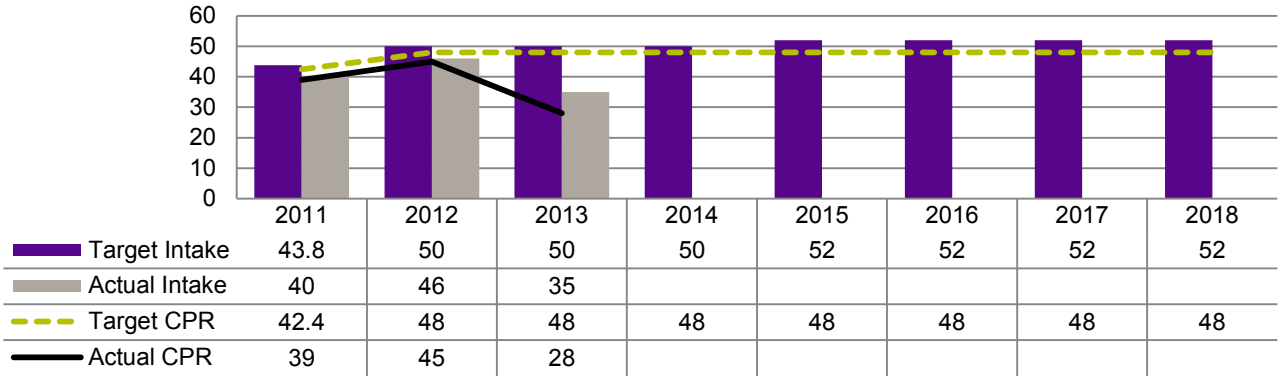
Core curricular consolidation and expansion of 500 level research electives

- The curricular sequences within cultural history and theory and within building technology and environmental systems represent core disciplinary streams in the BAS curriculum. The proposed modifications maintain the number of overall credits and courses within these streams yet adjusts the timing of their content delivery to enable better integration across coursework given within a single semester and to facilitate the introduction of a required elective (500 level) in each of these streams (cultural history/theory and building technology/environmental systems) in the fifth year of the program in preparation for thesis research.
- Strategic focus areas will be developed and coursework expanded in underdeveloped curricular streams:

- Digital Design Technologies: The proposed modifications are focused on expanding and building the Visual + Digital Media sequence to recognize the significance of digital media in current and future practice, not simply as representational tools, but as important technologies that are changing the ways in which we research, analyze, design, fabricate and produce architecture. Additional core courses are being proposed in digital fabrication (CAD/CAM technologies and rapid prototyping) and advanced visualization in support of architectural and urban analysis, and complex building modeling and management. In addition, the proposed sequence introduces a required upper-level elective selected from a range of course offerings within areas such as parametric design and scripting/coding, fabrication, GIS, building information modeling, advanced visualization, robotics, and interaction design. These courses would expand the curriculum in relation to technologies that are significantly impacting architectural practice and provide the groundwork for crossover courses between architecture and engineering and the development of a new Integrated Design program.
- Urbanism, Landscape, and Ecology: The existing courses in urbanism and landscape are being repositioned within the curriculum to better align this coursework within each semester and allow them to be rethought as a coherent curricular sequence. The expansion of the Urban/Landscape sequence will take place through a series of Global Cities electives that enable opportunities for the study of architecture and urbanism around the world in addition to a series of upper-level elective courses specifically focused on urbanism, landscape and ecology that represent strategic areas of growth and development for the school.
- Integrated Design: As detailed in Section G, in the coming year the School of Architecture will be developing its proposal for a new integrated Design program with both undergraduate and graduate degrees that focuses on the need for design in the contemporary design industry.

C. GRADUATE STUDIES PLAN

Figure 19: ARCH Graduate Intake Plan Performance to Target



	2011	2012	2013	2014	2015	2016	2017	2018
Target Intake	43.8	50	50	50	52	52	52	52
Actual Intake	40	46	35					
Target CPR	42.4	48	48	48	48	48	48	48
Actual CPR	39	45	28					

Program Modifications Phase I (Approved by University Senate in June, 2014)

- Eliminate the “Qualifying” terms for external applicants to the MArch program.

- To increase Waterloo Architecture’s ability to attract top applicants from pre-professional programs at Canadian and American universities as well as graduates of pre-professional and professional programs elsewhere in the world, we have eliminated the qualifying BAS terms for external applicants to the MArch program. This has been replaced with an additional year of coursework at the graduate level, so that applicants from other universities can enter directly into the first year of the MArch program. This will address the problem of placing external graduate students into undergraduate coursework, remove the implication that they are “unqualified” for graduate studies, and eliminate barriers, financial and otherwise, that have diminished our graduate program’s attractiveness to external students. In addition, it will bring the MArch program structure into better alignment with the calendar and expectations of external students seeking a first professional graduate degree in architecture and the accreditation requirements of the profession.

- Waterloo BAS graduates are exempted from these courses, based on prior completion as part of the BAS, which is a longer and more intensive program than most other pre-professional undergraduate programs. Their path would not change, but granting them advanced standing into the second year of the MArch would acknowledge the advanced level of professional coursework they have already completed in their honours pre-professional degree and support our continuing recruitment of these students into the MArch.

Program Modifications Phase II

- MArch curricular revisions

- Expanding co-operative education for graduate students coming from other institutions: Given that co-op is a recognized differentiating strength of the University of Waterloo in relation to other architecture schools and that experiential education is one of the strategic goals of the University, it is proposed to offer external students a co-op/internship experience at the end of the first year of the MArch. This modification has been supported by Co-operative Education and is going through the University approval process (fall 2014) for implementation in fall 2015.
- International opportunities and Global Cities electives: The Rome Program is one of the essential components of the pre-professional curriculum, exposing students first-hand to the study of architectural history and contemporary urban environments. Building upon this legacy, and in support of Engineering's Vision 2015 plan goals for internationalization, the School plans to offer this opportunity to external MArch students, while expanding its global study initiatives through an augmented series of study abroad electives focused on international architecture and urbanism in Europe, Asia and South America. These new curriculum options are going through the University approval process (fall 2014) for implementation in fall 2015.

- MArch thesis structure revisions

- Thesis research and design: To address graduate recruitment, retention and completion, a new curriculum proposal will transform the existing one-semester Arch 692 studio into a more highly structured and co-ordinated two-semester thesis research and design sequence to better support and direct the development of MArch thesis work and to more substantially incorporate innovative design research into the program. The two-semester sequence is a standard thesis framework for most graduate first professional architectural degree programs and will bring the Waterloo MArch into better alignment with the academic calendar and structure, available support systems and expectations of its peer and aspirant peer institutions. The first semester would be dedicated to thesis research and the second semester to thesis design and/or development, followed by a minimum of one additional independent semester for thesis completion and documentation. Students who wish to extend their thesis development period—to work as graduate research assistants on special projects with faculty, supplement their education with graduate teaching assistantships, or travel in support of their research— will be able to do so, up to a maximum of three additional consecutive semesters (one year) to complete their degrees.
- Architectural analysis and research methodologies: A new course in architectural analysis and research methodologies will be offered as a companion course to the thesis research and design studios to better enable students to position their work within the context of a larger theoretical discourse while giving them the methodological tools for precedent, program and site analysis, to prepare them for the undertaking of an architectural or urban thesis.
- Elective coursework in support of thesis: Students currently take elective coursework as a support for thesis research. The addition of a new core architectural theory course and required elective coursework in the areas of history/theory, building and environmental technologies, digital media, and urbanism and landscape to the undergraduate curriculum in the final year of the BAS program will not only encourage students to explore advanced research areas before they embark on thesis, but will also enable the expansion of offerings through the vertical sharing of 500-level electives as a support for thesis research.

Program Proposals Phase III

- Our plans related to Integrated Design will include a graduate program (see Section G).

- As part of this process, the Architecture School will also be exploring the potential of post-professional degree programs in additional areas of architectural specialization such as urban design and landscape, cultural history/theory, material technologies and other areas of advanced inquiry that would enable graduate students to further their study at the School.

Funding support for graduate students

- The School's avenues for improving graduate student financial support will be facilitated by ensuring BAS graduates who wish to complete in 12 months can do so, since currently most graduate students are funded in the first 12 months of the MArch.

- There has been modest success in raising money for graduate scholarships. The MITACS program has provided funding for graduate students in Architecture. A key initiative for the School moving forward will be to expand industry and professional partnerships and institutional and organizational networks that could provide research opportunities, professional experience and financial support for students. Clear potential exists in this area.

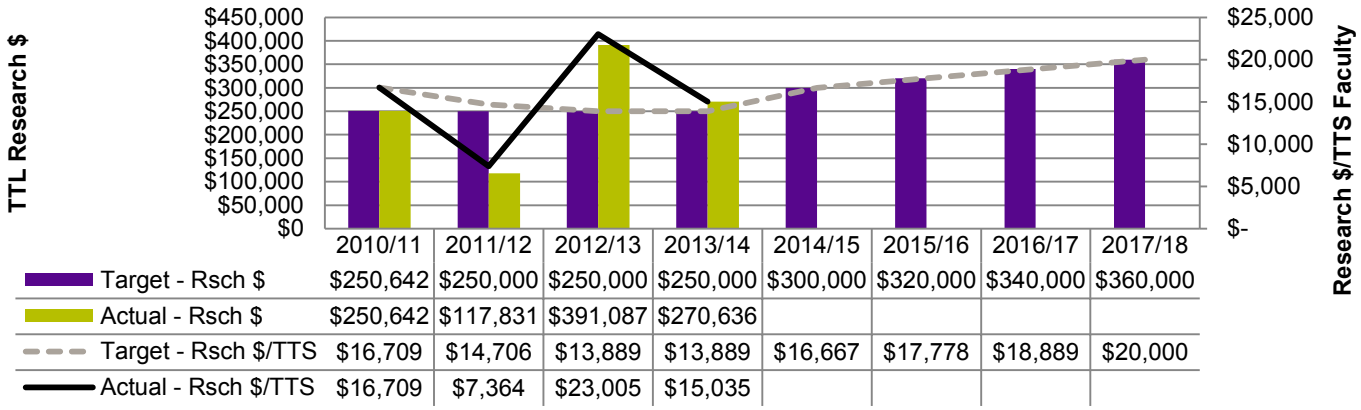
Promote the program internationally through publication, exhibition and outreach

- The graduate program must become as well known internationally as the undergraduate program is nationally. Future efforts for the program include enhancing the vehicles used to communicate about the School through publication (physical and digital), lectures/symposia, exhibition and other forms of outreach. The international reputation of the faculty is also a key contributor to the promotion of the program as are opportunities for students to study with prominent visiting faculty from other academic institutions.
- Graduate students in Architecture have also, in the last several years, become much more active in presenting papers and seeking publication of their research and design work. The Co-ordinator of Graduate Studies and Research has been active in disseminating calls for papers, requests for journal articles, and design competition announcements. The School must become more effective at distributing this information, find means to support student participation, build partnerships to create more opportunities and track the results more accurately.

D. RESEARCH PLAN

- Although research funding for architecture, as with the humanities, is quite low compared to engineering, it should be noted that research income almost doubled from $199,000 in 2011/12 to $391,087 in 2012/13.
- More faculty members are applying for grants and more are successful in attracting research support. These include Canada Council and Ontario Arts Council grants and industry sponsorship for research. Substantially increasing research funding and industry partnerships will be a major initiative of the School moving forward.

Figure 20: ARCH Research Funding Plan Performance to Target



	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Target - Rsch $	$250,642	$250,000	$250,000	$250,000	$300,000	$320,000	$340,000	$360,000
Actual - Rsch $	$250,642	$117,831	$391,087	$270,636				
Target - Rsch $/TTS	$16,709	$14,706	$13,889	$13,889	$16,667	$17,778	$18,889	$20,000
Actual - Rsch $/TTS	$16,709	$7,364	$23,005	$15,035				

- The Focused Evaluation of 2013 concentrated on the issues of volume and quality of research, recognition of faculty accomplishments and progress through ranks. At that time two additional faculty members had been promoted to full professor. Since that time, one supplementary faculty member (the new Director) has been hired as a full professor, and in 2014 two additional faculty members were promoted to full professor. There are currently six full professors at the School, an increase of five since the initial accreditation visit of 2011.
- In the report for the Focused Review the School provided a full account of the accomplishments of Architecture faculty members since March, 2011. The list is substantial: national and international awards, design work, scholarly papers and articles and books from major international publishers.
- In the past year, national and international awards of the faculty have included a Special Mention Award for *Artic Adaptations*, Canada's national exhibition at the 14th International Architecture Venice Biennale, the first time ever awarded to Canada.

E. SPACE PLAN

Space limitations have defined the cap on undergraduate and graduate targets for the last five years and will continue to do so until our physical facilities are expanded. In the short term, efforts are being made to more efficiently utilize space within the existing facility through scheduling and the overlap of teaching, studio and graduate office space.

- Over the past year, the satellite facility in Rome has undergone substantial renovations to both upgrade and expand the facility that has been supporting Architecture's Rome Program for the last three decades and that will offer new space and facilities to host other Waterloo academic programs. The improvements include necessary structural steel beams, the exposure of original historic ceiling and other details, the resurfacing of walls and refinishing of floors in addition to electrical and technology upgrades and the incorporation of new lighting and furnishing. The renovations, which will be completed in January, 2015, will substantially improve the facility and enhance the already tremendous experience for our students and faculty.
- The new programs to be proposed in Integrated Design will require an additional 80,000 square feet of teaching, research and workshop/lab space to be located in Cambridge on a site adjacent to the present School of Architecture in order to share and optimize the use of faculty and facilities.
- In addition to the campus expansion in Cambridge, the School is also looking to launch a 5,000 square foot satellite in Toronto—a city which currently operates as an urban laboratory for many of the projects taken on at the School and which provides the vast majority of local co-op placements for our students. This space, which would be primarily for graduate students within architecture and design, would enable the School to expand its reach and range of academic, professional and industry partners, facilitate the incorporation of international visiting faculty, while supporting studios focused on the future of architecture and design.

F. ADVANCEMENT PLAN

- Architecture alumnus Alison Brooks received the Engineering Alumni Achievement Medal and was named one of the most influential people in Britain this past year.
- Architecture alumni are very connected to the School and the Director is expanding alumni related activities to include alumni events and outreach in relation to ongoing School events such as lecture series, symposia, exhibitions and special events.
- Advancement activities for Architecture are expected to substantially increase in intensity in relation to fundraising for the new facilities in Cambridge for the new program to be proposed in Integrated Design.

G. PROPOSED NEW PROGRAM PLAN: INTEGRATED DESIGN

In the coming year the School of Architecture will be further developing its proposal for a new Integrated Design program, with both undergraduate and graduate degrees, that focuses on the need for design in the contemporary digital industry. This is the most critical endeavour for the School moving forward.

- The intention of the new programs is to substantially increase the student population on the Cambridge campus, enrich the student experience, open new expanded study opportunities for architecture students at the graduate and undergraduate levels, introduce new faculty that will teach across programs, expand physical and fiscal resources, enhance connections with local, regional and national high technology industries and provide other opportunities for undergraduate architecture students to pursue non-professional graduate degrees in a related discipline while providing channels for their emergent entrepreneurial energies.
- The new design program will operate at the nexus of industrial design, communication design and interaction design as well as emerging fields in new digital design technologies.
- These degree programs will be grounded in coursework in relation to five parallel academic streams in design, culture, technology, communication and entrepreneurship.
- As a non-professional program, the Master in Integrated Design will also provide expanded opportunities for undergraduate students across the University to study design at the graduate level.

Chemical Engineering Department

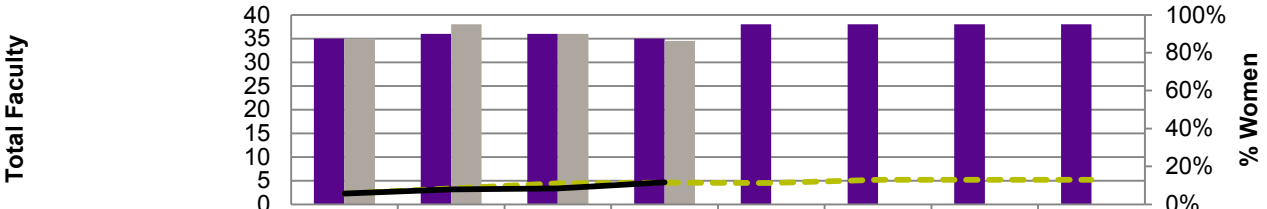
Eric Croiset, Chair

Chemical Engineering has met its established targets for staff hiring, faculty PEng licensing, undergraduate student intake and domestic graduate student intake. We have exceeded target for total graduate student intake because of a large increase in MEng students. However, the past year was marked by the unprecedented resignation of three faculty members, which affected our faculty complement target, despite the hiring of 1.5 new faculty members. This also had a direct negative impact on research funding.

A. FACULTY AND STAFF PLAN

- Our faculty complement declined because of three resignations in 2013, which was partly compensated by the hiring of 1.5 faculty members (one of which was an exceptional hire, not envisioned in our original plans, who is shared with the Physics Department).
- Two positions in the current complement will be terminated at the end of 2014 (at the end of contracts that were linked to the UAE campus).
- As of August 1, 2014, we have five positions advertised (three replacements and two new). It is expected that most of those five positions will be filled by summer 2015. We also anticipate three additional replacement positions to be advertised in 2015.
- Of the two faculty members hired in the last reporting period, one is a woman. For the current five positions advertised, we are hopeful to hire at least two female candidates.

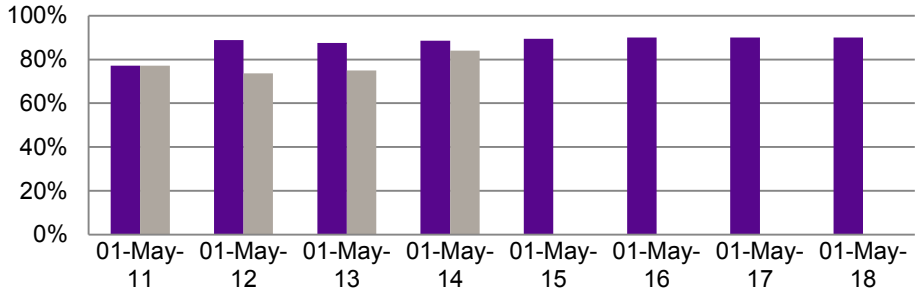
Figure 21: CHE Regular Faculty Complement Plan Performance to Target



	01-May-11	01-May-12	01-May-13	01-May-14	01-May-15	01-May-16	01-May-17	01-May-18
Target Total	35.0	36.0	36.0	35.0	38.0	38.0	38.0	38.0
Actual Total	35	38	36	34.5				
Target % Women	5.7%	8.3%	11.1%	11.4%	11.2%	13.0%	13.0%	13.0%
Actual % Women	5.7%	7.9%	8.3%	11.6%				

- A significant effort has been made to increase the number of faculty members holding or applied for a professional engineering license, which is now above 84%. We aim to have 100% of faculty members with an undergraduate degree in engineering either registered or applied for PEng by May 1, 2015.

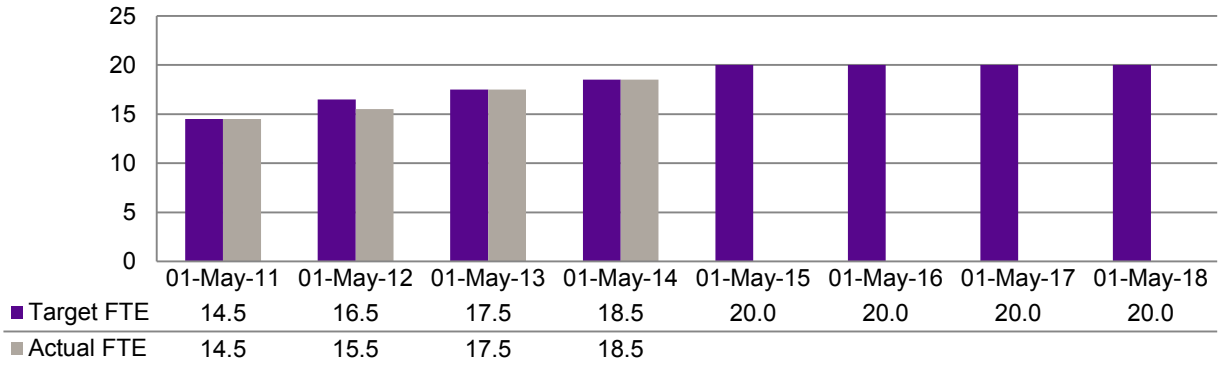
Figure 22: CHE Regular Faculty PEng Status Performance to Target



	01-May-11	01-May-12	01-May-13	01-May-14	01-May-15	01-May-16	01-May-17	01-May-18
Target % Registered&Applied	77.1%	88.9%	87.5%	88.6%	89.4%	90.0%	90.0%	90.0%
Actual % Registered&Applied	77.1%	73.7%	75.0%	84.1%				

- Staff complement is progressing according to schedule.

Figure 23: CHE Staff Complement Plan Performance to Target



Introduce strategies for inter-departmental social and professional interactions

- We have continued to take advantage of the facility in E6 to organize several well-attended social events, sometimes with students and sometimes for faculty and staff only, improving the conviviality and collegiality within the department. We are now organizing an annual casual celebration lunch in the E6 atrium after spring convocation, about which we have received excellent feedback from students and parents alike.
- Departmental seminar series continue to be well attended, in particular by graduate students.

B. UNDERGRADUATE STUDIES PLAN

- The intake of undergraduate students remains on target for the Chemical Engineering program. The program has been successfully accredited for a six-year period. A very important priority is now to prepare for the new outcomes-based accreditation, which will be done under the leadership of a soon-to-be-hired Graduate Attributes Lecturer and the Undergraduate Review Committee.
- The Nanotechnology Engineering program is slightly below intake target. This program's directorship structure has been modified for sustainability and efficiency and to improve outreach to current and prospective students. Once this new structure is in place, we expect to see an increase in student intake and a reduction in existing student transfers to other programs.

Figure 24: CHE Undergraduate Intake Plan Performance to Target

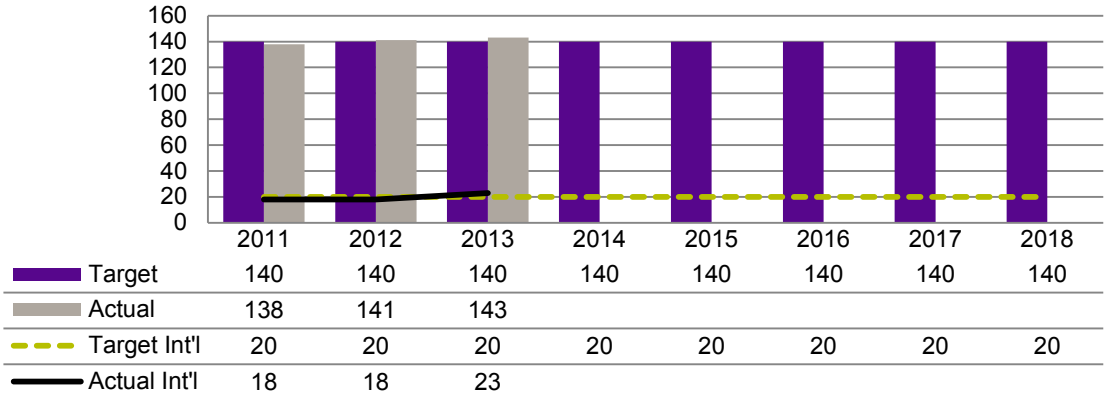
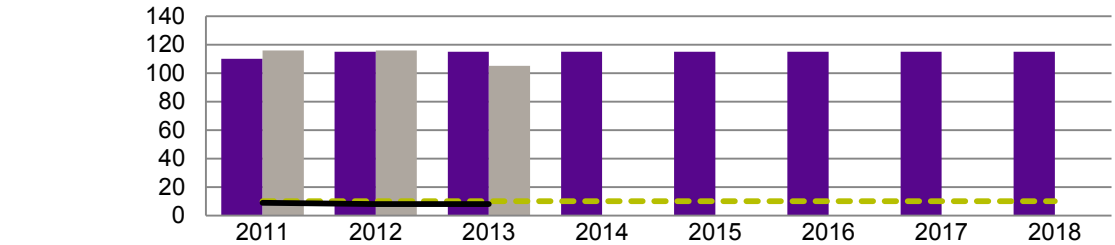


Figure 25: NANTE Undergraduate Intake Plan Performance to Target



	2011	2012	2013	2014	2015	2016	2017	2018
Target	110	115	115	115	115	115	115	115
Actual	116	116	105					
Target Int'l	10	10	10	10	10	10	10	10
Actual Int'l	9	8	8					

Improve the laboratory experience in the curriculum

- Through the Vision 2015 Undergraduate Laboratory Enhancement Initiative, we have continued purchasing major equipment for the undergraduate laboratory. The highlight of the equipment purchased is a complete distillation column system, which can also serve as a demonstration of "mini-plant" for junior students.

Improve the undergraduate curriculum

- Most undergraduate curriculum efforts are currently geared toward the new outcomes-based accreditation.
- Technical Elective offerings have been modified for improved student flexibility.
- Notably, in the past year, we have introduced an ethics and equity degree milestone which can be satisfied by taking a complementary studies elective course from an approved list or by completing the WatPD course on professionalism and ethics in engineering practice.

Improve the co-op experience

- Issues remain with the employment of first-year students. We continue to hire a large number of first-year co-op students in our laboratories, with the help of incentives from the University and the Faculty.

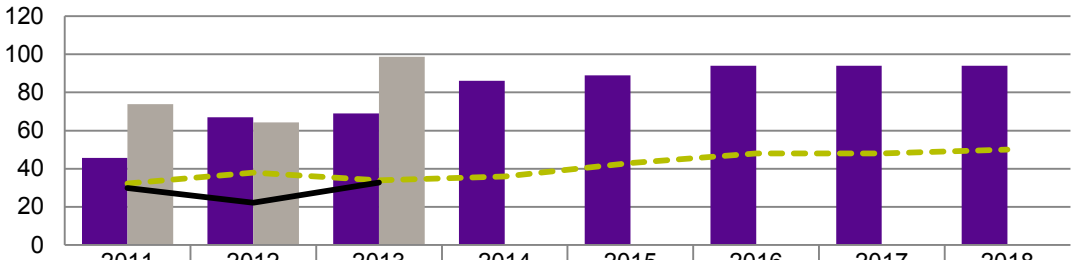
Improve links with alumni and industry

- We have created an electronic newsletter ("The Distillate") and some videos, available on our website. We are in discussion with the Engineering Communications Team to analyze the impact of this newsletter and to decide how to best proceed regarding department promotion to alumni and others.

C. GRADUATE STUDIES PLAN

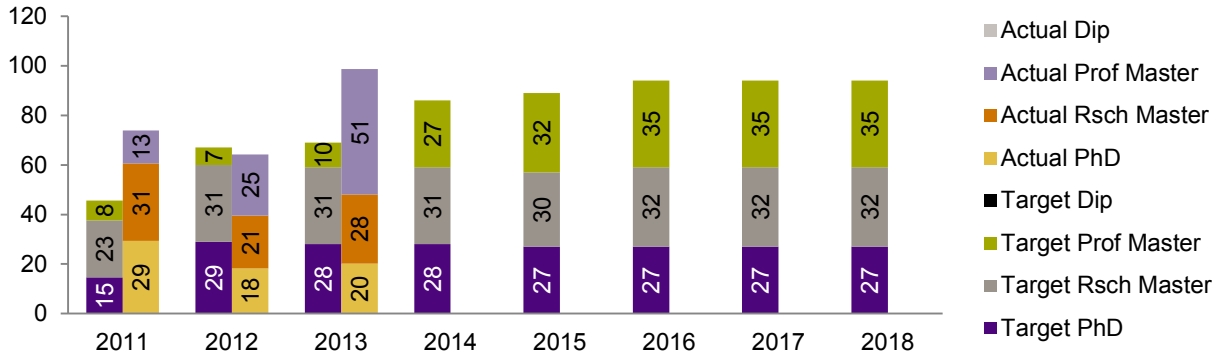
- Graduate student enrolment for 2013 has been above target (and on target for CPR), essentially because of the important increase in MEng students. The applicants for our MASc program that we could not place, but who satisfied the minimum requirement, were offered to join the MEng program, and many accepted.

Figure 26: CHE Graduate Intake Plan Performance to Target by Visa Status



	2011	2012	2013	2014	2015	2016	2017	2018
Target Intake	45.6	67	69	86	89	94	94	94
Actual Intake	73.9	64.2	98.7					
Target CPR	32.3	38	34	36	43	48	48	50
Actual CPR	29.9	22.2	32.7					

Figure 27: CHE Graduate Intake Plan Performance to Target by Program Type



Improve recruitment of high quality graduate students

- The department continues to participate in all Faculty-organized recruitment activities.

Improve the graduate course offering and quality

- An additional core graduate course, Applied Engineering Mathematics, has been approved and mounted.
- MASc students are now asked to make a final oral examination in front of the thesis readers. This is intended to make the completion of a MASc more significant and to ensure high expectations for research quality.

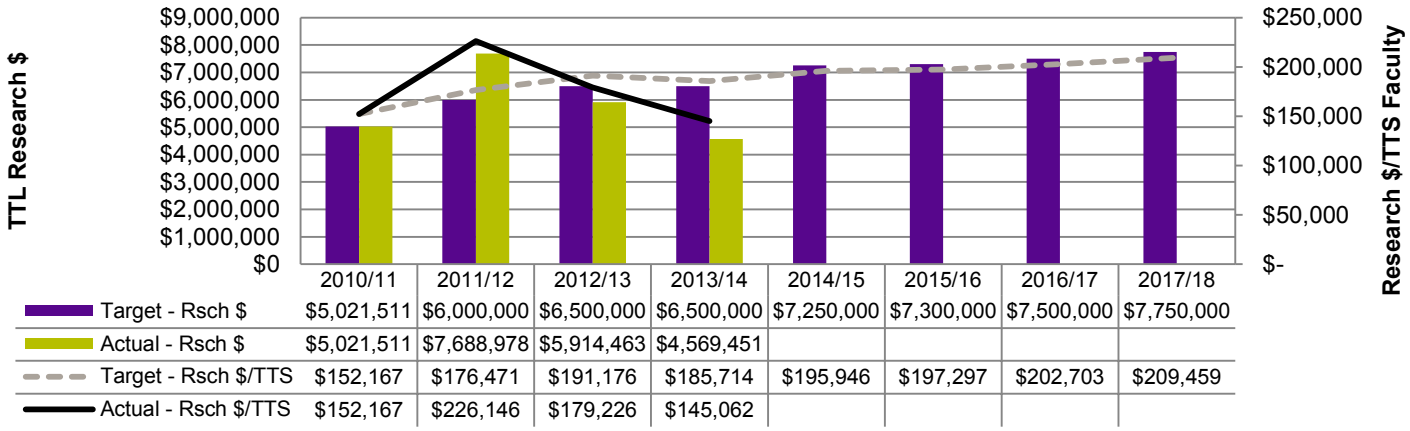
Determine the feasibility of an online MEng program

- There has been some informal discussion within the department regarding possible MEng programs.

D. RESEARCH PLAN

- For the last two years, research funding has decreased. We attribute this decrease to the unprecedented loss of four faculty members in recent years. Although those faculty members are being replaced (not all yet), it will take some time for new hires to build up their research programs to a level of funding commensurate with established researchers.
- The department is strongly encouraging group projects for major proposals. We expect to be more successful in the coming years, in particular through more strategic allocation of NSERC CRC Chairs.
- Our planned research theme documents have not yet been developed.

Figure 28: CHE Research Funding Plan Performance to Target



	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Target - Rsch $	$5,021,511	$6,000,000	$6,500,000	$6,500,000	$7,250,000	$7,300,000	$7,500,000	$7,750,000
Actual - Rsch $	$5,021,511	$7,688,978	$5,914,463	$4,569,451				
Target - Rsch $/TTS	$152,167	$176,471	$191,176	$185,714	$195,946	$197,297	$202,703	$209,459
Actual - Rsch $/TTS	$152,167	$226,146	$179,226	$145,062				

Improve research support

- The hiring of a Research Administrator has had an immediate very positive impact to researchers.
- Plans to hire an additional analytical technician are on hold until the University's new budget model is in place.

E. SPACE PLAN

- Due to the reduction in our growth plans following closure of the UAE campus, construction of E8 is not currently being pursued. Rather, efforts are being made to relinquish space to the Faculty for growth in other programs, while limiting the associated negative impact to our department.

F. TECHNICAL SERVICES PLAN

- With the hiring of the Technical Operations Director, we have seen major positive changes in technical services. Electronic work requests have been successfully implemented in a pilot group and are now being implemented with a second group.

Civil & Environmental Engineering Department

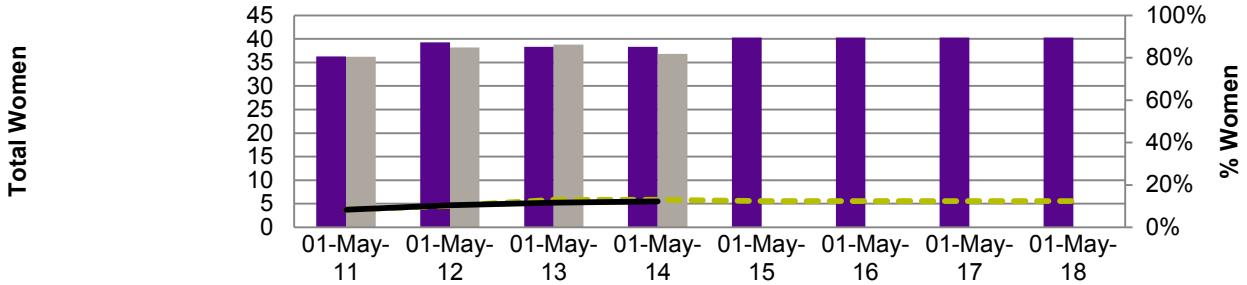
Neil Thomson, Chair

The cornerstone element in the Civil & Environmental Engineering (CEE) Vision 2015 plan was participation in the University of Waterloo UAE initiative, which has since been cancelled. This initiative had been associated with a target intake of 60 students into the Civil Engineering program at the UAE campus by 2015, and the hiring of 11 new faculty and five new staff in CEE. Our enrolment and graduation numbers were expected to rise concomitantly, as was graduate student enrolment and research activity. Our targets have been adjusted to remove this planned growth, and many of the goals and strategies developed for the CEE Vision 2015 plan are no longer relevant; specifically those that applied to faculty and staff hires. Despite these changes, significant progress has been made on many goals, most notably through the completion of a comprehensive undergraduate curriculum and course content review.

A. FACULTY AND STAFF PLAN

- On May 1, 2014 the CEE faculty complement includes a joint exceptional hire with another Waterloo Faculty (Prof. N. Basu, 0.5 FTE) that was not included in the Vision 2015 hiring plan but does not include Prof. H. Baaj, who started on September 1, 2014 as Junior Chair to complement the endowed Norman W. McLeod Chair.
- On May 1, 2014 we also had two replacement positions to be filled: one retirement (Prof. F. Saccomanno) and one to replace Prof. K. Soudki who passed away in September, 2013.
- A continuing lecturer position (Graduate Attributes Lecturer) was recently approved as one means of continuous improvement of our undergraduate engineering programs. This position is presently open.

Figure 29: CEE Regular Faculty Complement Plan Performance to Target



	01-May-11	01-May-12	01-May-13	01-May-14	01-May-15	01-May-16	01-May-17	01-May-18
Target Total	36.3	39.3	38.3	38.3	40.3	40.3	40.3	40.3
Actual Total	36.2	38.2	38.8	36.8				
Target % Women	8.3%	10.2%	13.1%	13.1%	12.4%	12.4%	12.4%	12.4%
Actual % Women	8.3%	10.5%	11.6%	12.3%				

Figure 30: CEE Regular Faculty PEng Status Performance to Target

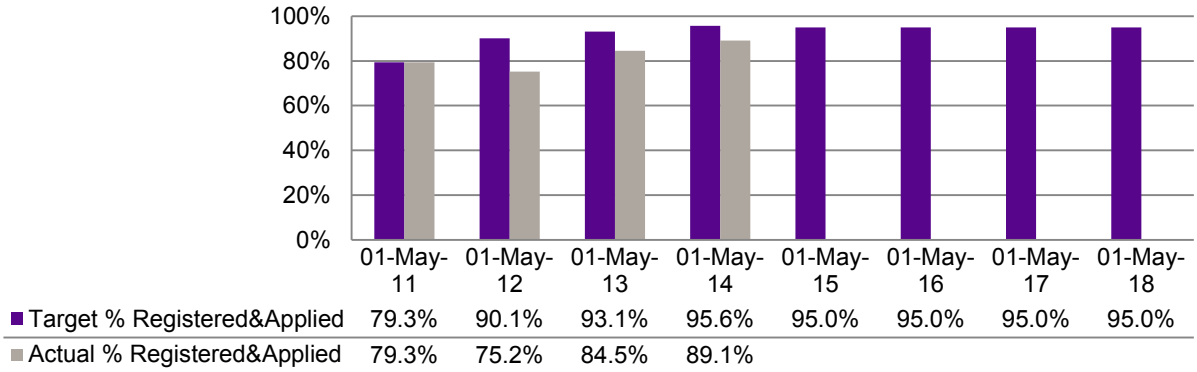
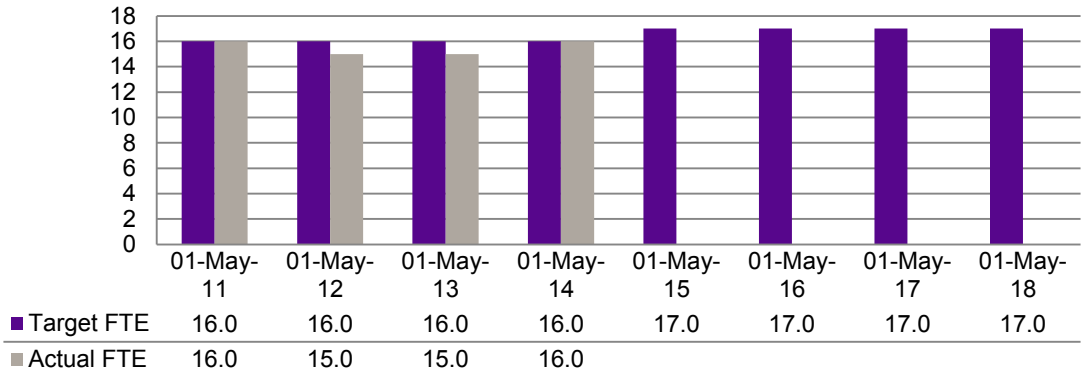


Figure 31: CEE Staff Complement Plan Performance to Target



Administrative support for the graduate office

- With the reconsolidation of the UAE program, the additional staff position to support the graduate office is no longer available. To address the continued need for administrative support, the responsibilities of the Department Secretary were reworked to provide limited back-up coverage and the responsibilities of the Administrative Co-ordinator, Graduate Studies were reviewed to improve efficiency and client service.

Technical staff requirements

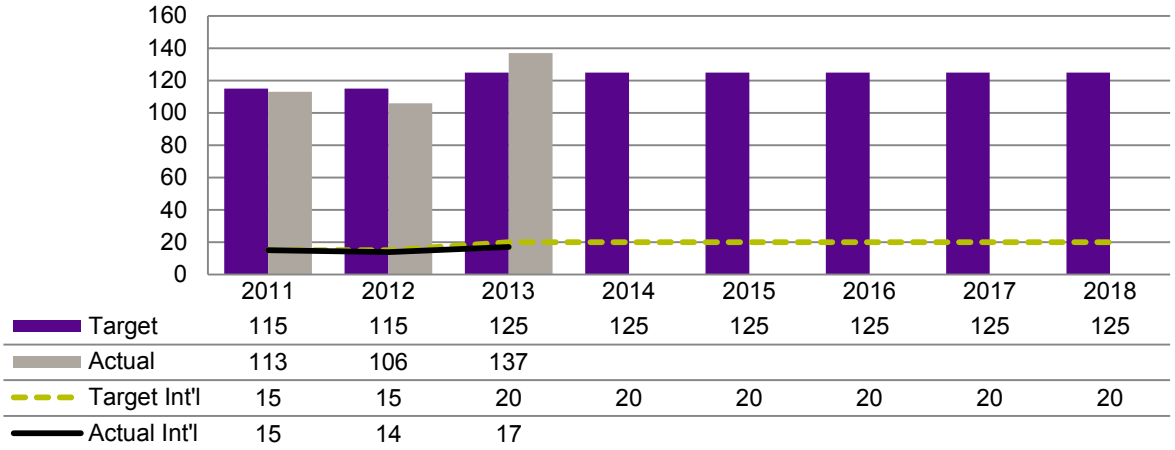
- With the reconsolidation of the UAE program, four planned new technical staff positions are no longer available; hence an examination of the technologist structure is underway. This review, being led by the Administrative Officer, is intended to be all encompassing and will address efficiencies and deficiencies with the current structure, staffing levels, responsibilities and succession planning.
- In April, 2013, it was determined that day-to-day responsibility for the department's health and safety program, something that would naturally fall to the senior technician envisioned in our original Vision 2015 plan, could not wait for the results of the technologist structure review. As such, one of our senior technical staff, Terry Ridgway, was appointed the CEE Health & Safety Co-ordinator in April, 2013.
- In the interim, as the technologist structure review is in progress, a contract lab assistant was hired to support the transport/structures area. To improve workflow in the structures laboratory, the Structures Lab Co-ordinator implemented a work management scheduling system in 2014.
- In response to an identified need to have more than one technical support staff available to assist with undergraduate teaching needs, an additional technical staff person has been identified to become proficient in surveying, as a back-up and for successional planning.

B. UNDERGRADUATE STUDIES PLAN

- Intake into Civil Engineering in 2013 was above target; once again this is an academically strong cohort.
- Environmental Engineering intake remains strong but slightly under target. This appears to be a consistent trend. Focussed efforts by the engineering recruitment group, with input from the department, are required to increase the pool of strong applicants from across Canada.

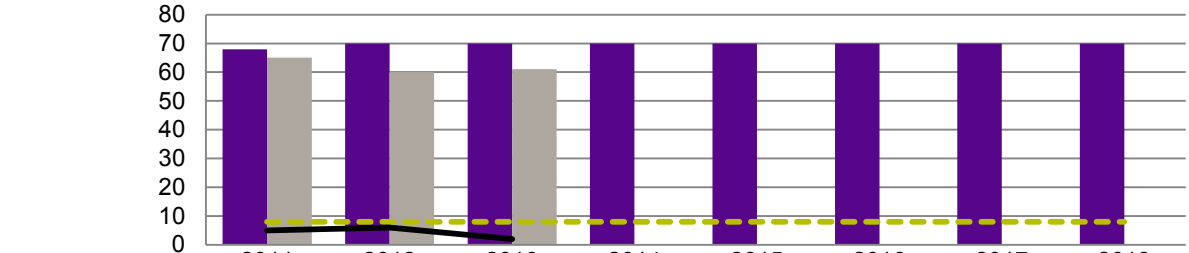
- Intake into Geological Engineering was above target in 2012, but below target in 2013.

Figure 32: CIVE Undergraduate Intake Plan Performance to Target



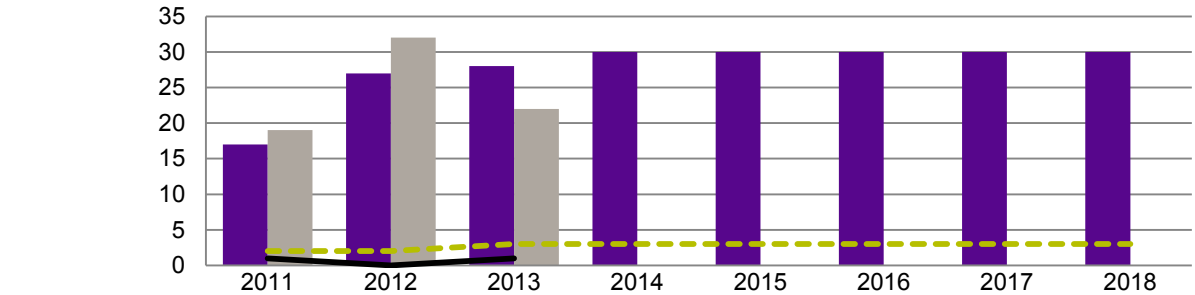
	2011	2012	2013	2014	2015	2016	2017	2018
Target	115	115	125	125	125	125	125	125
Actual	113	106	137					
Target Int'l	15	15	20	20	20	20	20	20
Actual Int'l	15	14	17					

Figure 33: ENVE Undergraduate Intake Plan Performance to Target



	2011	2012	2013	2014	2015	2016	2017	2018
Target	68	70	70	70	70	70	70	70
Actual	65	60	61					
Target Int'l	8	8	8	8	8	8	8	8
Actual Int'l	5	6	2					

Figure 34: GEOE Undergraduate Intake Plan Performance to Target



	2011	2012	2013	2014	2015	2016	2017	2018
Target	17	27	28	30	30	30	30	30
Actual	19	32	22					
Target Int'l	2	2	3	3	3	3	3	3
Actual Int'l	1	0	1					

Comprehensive curriculum and course content review

The last major changes to the Civil, Environmental and Geological Engineering curricula were made in 2000. A comprehensive curriculum and course content review was identified as a priority in our Vision 2015 plan.

- Following a multi-year process (summarized below), new curricula were approved by the Department of Civil & Environmental Engineering and the Geological Engineering Board in April and May, 2014 and by the Faculty Undergraduate Studies Committee in August, 2014. Approval by the Engineering Faculty Council and

Senate Undergraduate Council will be requested in fall 2014, with implementation of the new curricula planned for the 2015/2016 University of Waterloo undergraduate calendar.

- In late 2011, the renewal of the Civil, Environmental, and Geological curricula was initiated, with a goal to better reflect modern approaches to learning, leverage the impact the internet is having on student learning, move toward an outcomes-based teaching philosophy, and attend to identified shortcomings of our existing curricula. Prior to this multi-year process, we held three departmental retreats focused on: understanding students as learners; the ideal graduate; and mapping attributes and outcomes. Detailed "philosophical pillars" were proposed, including pillars supportive of: student understanding of the context of their course material; student engagement; knowledge integration; critical thinking; deep learning; extending experiential education; outcomes-based assessment; and reduced workloads to allow students to think more deeply about course material.
- A comprehensive assessment and renewal of our current programs resulted in a broad range of proposed changes to our curricula from first year through graduation. A common first year has been maintained for all three programs. The first-year changes are intended to improve student engagement and success, to provide better integration with course material in second-year courses and above, and to increase student exposure to engineering faculty in the classroom. The new curricula include a number of new courses available to students, as well as revision of numerous existing courses. The curriculum changes have helped to:
  - improve the linkage between desired program-wide, content stream, and individual course outcomes to course content;
  - cull extraneous or peripheral material from the curriculum;
  - introduce design ideas in core curriculum from 1A, and enhance design coverage everywhere;
  - improve integration of ideas, both vertically in subject streams from year-to-year, and horizontally between courses in a given term;
  - broaden the scope of the available electives and augment program flexibility;
  - improve coverage of energy, air quality and ethics in the Environmental Engineering curriculum;
  - increase coverage of water resources and transportation engineering in the core Civil Engineering curriculum;
  - strengthen the idea of working with uncertainty in the Civil Engineering program.
- The new framework also sets the scene for instructors to encourage deeper learning by: using open ended problems, so that students think about and weigh alternative solutions; assigning problems for which they must find information online so that they become comfortable with evaluating the quality of the information found on the internet; using computational tools so that students can solve multiple problems of any given kind and see how changes to geometry or other input parameters affects outcomes; and making connections between course concepts through shared assignments in simultaneous courses.

Laboratory equipment upgrades and enhancements

- CEE is committed to using the funds available for laboratory enhancement to enrich the hands-on experience of its undergraduate students and, as such, has selected enhancements that will improve that experience and impact a significant number of students in all three programs. Almost $500,000 was invested in 2013/14.

Student retention

- With our focus on curriculum renewal in recent years, action on this strategy was delayed to early 2015.

Student engagement/experience

- In winter 2014 we initiated a review of capstone design project courses with the objectives of enhancing engineering design content in our programs, promoting creative problem solving and innovation and ensuring course curriculum is appropriate for the graduate attributes to be measured. This effort is ongoing with particular focus on increased industry participation, enhanced innovation in student designs, implementation of a "pitch competition" at the end of 4A, and extensive changes to the design symposium at the end of 4B.
- A process to select an outstanding CEE TA each term has been implemented, with a first award in fall 2013.
- Two new undergraduate project teams, Concrete Canoe and ASCE Steel Bridge, were formalized in 2013/2014, with the Concrete Canoe team participating in its first national competition in May, 2014. We have also initiated discussions with the student project/chapter leads with the goal to provide sufficient faculty and financial support, but not to dictate direction or restrict student enthusiasm and creativity.
- Faculty attendance at convocation and other student events has increased.

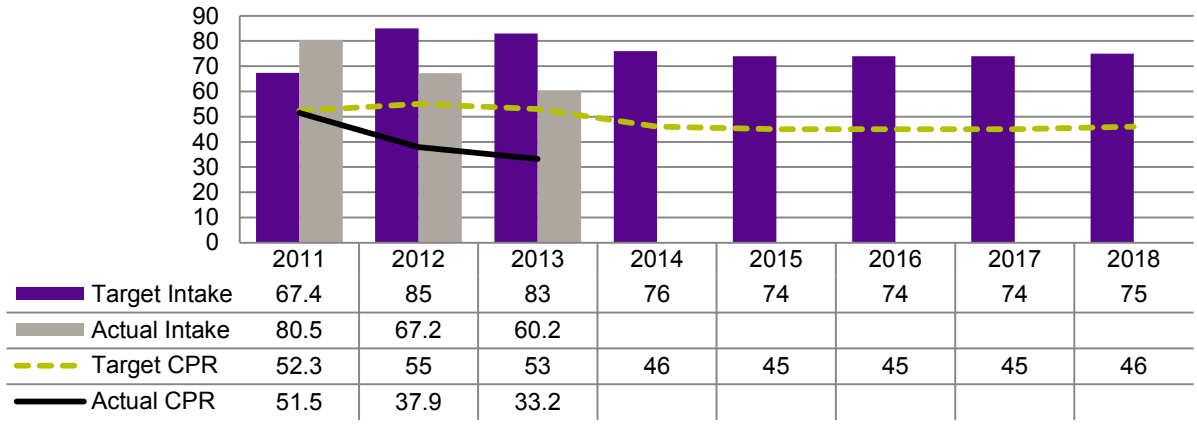
Potential new Architecture Engineering (AE) program

- The AE Committee is meeting regularly and is working toward the completion of a draft Proposed Brief for an Architecture Engineering Undergraduate Program. We expect an initial draft to be available for internal review by CEE in September, 2014.

C. GRADUATE STUDIES PLAN

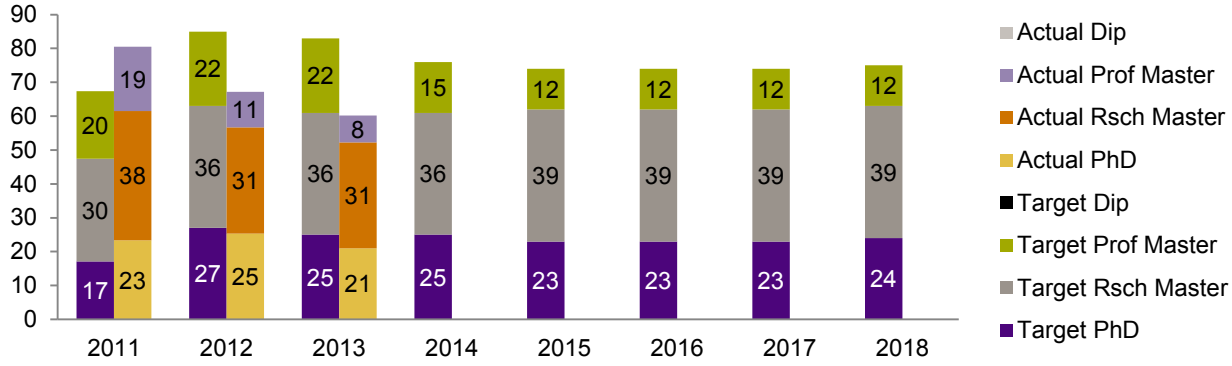
- Overall graduate growth has been much slower than expected. A number of factors may be responsible for this including: (i) additional research funding required to support MASc and PhD students; (ii) capacity of faculty members to supervise additional students; and (iii) insufficient number of good quality applicants.
- Item (iii) is particularly relevant to the decreased intake of CPR students. Increasing overall graduate student quality remains an issue.
- We have experienced a significant increase in the ratio of research graduate students to tenured/tenure-stream faculty, from 4.5 to 5.5 (compared to a Faculty-wide average of 4.5). This level of graduate student load is likely the maximum possible and additional enrolment will be limited to new hires.

Figure 35: CEE Graduate Intake Plan Performance to Target by Visa Status



	2011	2012	2013	2014	2015	2016	2017	2018
Target Intake	67.4	85	83	76	74	74	74	75
Actual Intake	80.5	67.2	60.2					
Target CPR	52.3	55	53	46	45	45	45	46
Actual CPR	51.5	37.9	33.2					

Figure 36: CEE Graduate Intake Plan Performance to Target by Program Type



Graduate course offerings

- We have established a core set of graduate courses normally offered at least once each academic year.
- The number of graduate courses offered remained the same at ~20 courses (600 and 700 level) per year. Given the resources available this number of graduate courses cannot be significantly increased.

MEng program(s)

- Due to low enrolment attributed to changing demographics in the applicant pool for the Infrastructure MEng program, we are no longer offering this program.

- Additional growth in the MEng (course-based) program needs to be promoted through strategic changes to the structure of the MEng program and the adoption of improved recruitment practices, which are currently co-ordinated by the Faculty of Engineering. Action on this objective is planned for early 2015.

Graduate student experience

- In 2013/14 approximately 10 CEE PhD students who have completed the CTE Certificate in University Teaching program were provided the experience to be a sessional lecturer.
- A process to select an outstanding CEE TA each term has been implemented: Amr Abdel and Dan Pickel received this award in 2013/14.
- CEE is working through a series of renovations to graduate student office space. We have also invested over $250,000 to date to purchase 126 state-of-the-art study carrels for graduate student use.

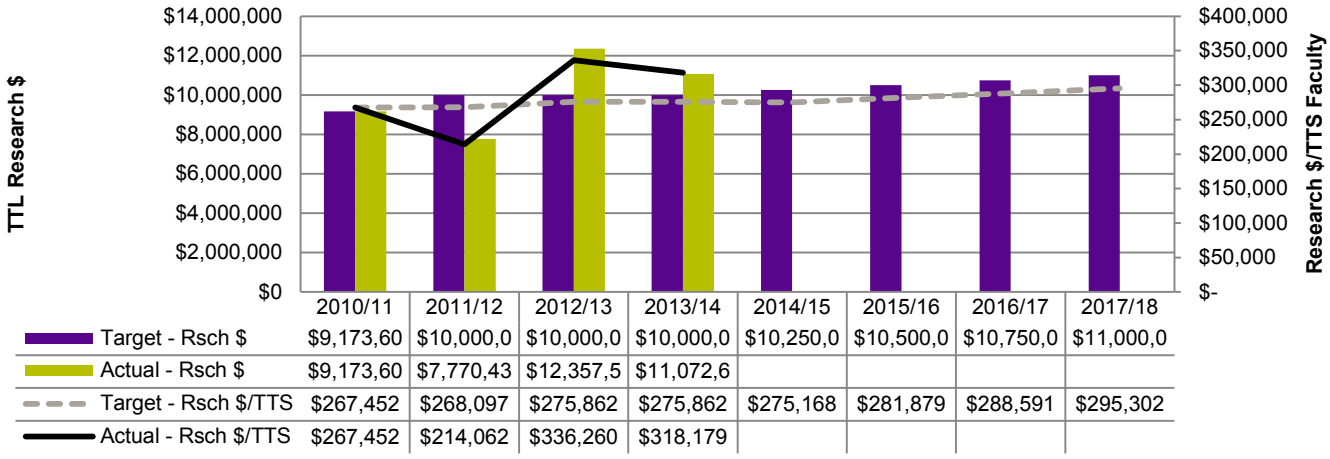
Graduate student progression

- Due to our focus on the undergraduate curriculum to date, this objective is yet to be implemented.

D. RESEARCH PLAN

- CEE research funding rose from $9.1 million in 2010/11 to $11.1 million in 2013/14.
- CEE accounts for 21.2% of total research funding to the Faculty of Engineering.
- Our funding per faculty member exceeded target in 2013/14 by over $40,000, reaching $318,179.

Figure 37: CEE Research Funding Plan Performance to Target



	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Target - Rsch $	$9,173,60	$10,000,0	$10,000,0	$10,000,0	$10,250,0	$10,500,0	$10,750,0	$11,000,0
Actual - Rsch $	$9,173,60	$7,770,43	$12,357,5	$11,072,6				
Target - Rsch $/TTS	$267,452	$268,097	$275,862	$275,862	$275,168	$281,879	$288,591	$295,302
Actual - Rsch $/TTS	$267,452	$214,062	$336,260	$318,179				

Identification of emerging research areas

- Some minor progress has been made on this objective, but we need to make it a priority for 2014/15.

Benchmarking of CEE research and funding

- We are waiting for guidance from the Faculty of Engineering on an appropriate set of metrics.

Conrad Business, Entrepreneurship & Technology Centre

Mark Weber, Director

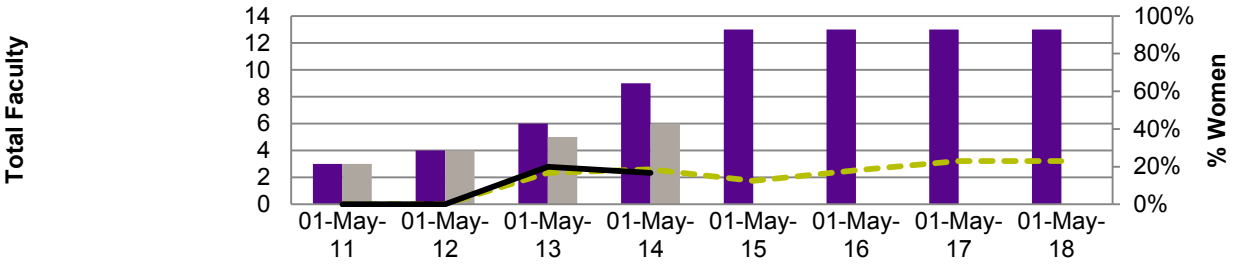
The past year has been an exciting and busy one for Conrad. We have added new faculty, developed increased marketing capacity that is already showing results, worked to advance the entrepreneurship agenda in Engineering and the broader University, and we have done all this during a period of leadership transition.

A. FACULTY AND STAFF PLAN

- At the end of this reporting period, Conrad was in the process of hiring two new full-time lecturers, which would bring us to 89% of target for the year. Recruiting is also underway for two tenure-stream appointments.

- We anticipate faculty hiring to lag target over the next two years due to delays in launching new programs. Reaching our original plan target is contingent on the successful launch of a part-time MBET program in a competitive market, and the uptake of our undergraduate programming.

Figure 38: CONRAD Regular Faculty Complement Plan Performance to Target



	01-May-11	01-May-12	01-May-13	01-May-14	01-May-15	01-May-16	01-May-17	01-May-18
Target Total	3.0	4.0	6.0	9.0	13.0	13.0	13.0	13.0
Actual Total	3	4	5	6				
Target % Women	0.0%	0.0%	16.7%	18.6%	12.5%	18.0%	23.0%	23.0%
Actual % Women	0.0%	0.0%	20.0%	16.7%				

Transition from a model of using faculty seconded from other departments and sessional instructors to one with a core of tenured/tenure-track faculty supplemented with sessionals who bring professional experience to the classroom

- Progress is being made on this objective, with six full-time faculty now in the unit: Four tenure-stream and two lecturers. As of May 1, 2014, four additional full-time faculty are being recruited.

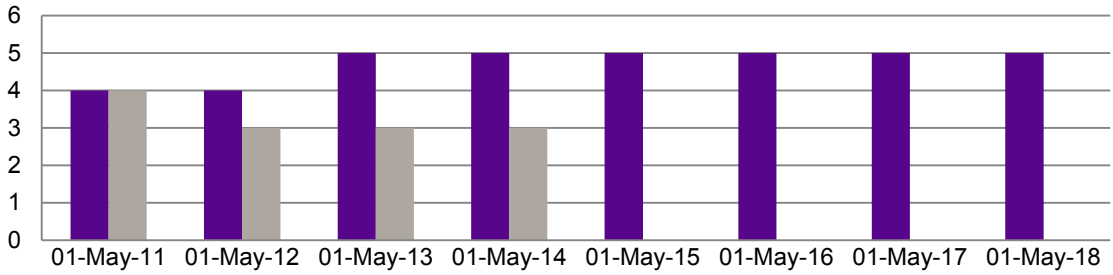
Convert the Enterprise Co-op Co-ordinator position from a contract to a continuing appointment

- Wayne Chang is now full-time, co-ordinating E Co-op and teaching in the Centre's undergraduate programs.

Replace individuals in non-complement/part-time positions such as the Entrepreneur-in-Residence and Lead Mentor/Business Plan Coach as required during the planning period

- Replacements have not yet been required in these roles.

Figure 39: CONRAD Staff Complement Plan Performance to Target



	01-May-11	01-May-12	01-May-13	01-May-14	01-May-15	01-May-16	01-May-17	01-May-18
Target FTE	4.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
Actual FTE	4.0	3.0	3.0	3.0				

Hire an IT and Online Learning Support Manager to support growth and launch of new programs

- This has not yet been required because of the delay in launching the part-time MBET program.

B. UNDERGRADUATE STUDIES PLAN

Secure permanent mandate to run Enterprise Co-op

- E Co-op has been a great success. Conrad is reporting to its stakeholders now, mid-mandate.

Collaborate with CECA in developing programs around alternative labour models

- Conrad plays an active role in engaging community startups in the Bridging Entrepreneurs to Students (BETS) program, described more fully in Section III.H of this report.

Explore opportunities to create undergraduate entrepreneurship options/specializations

- Engineering's Entrepreneurship Option has now been approved and launched in September, 2014.
- Consultations across campus are progressing on making a minor in entrepreneurship available to all Waterloo undergraduates. This has become a priority for Conrad, and central to the emerging entrepreneurship strategic priorities for the University. Program proposals and new course offerings will enter the approval process in fall 2014.

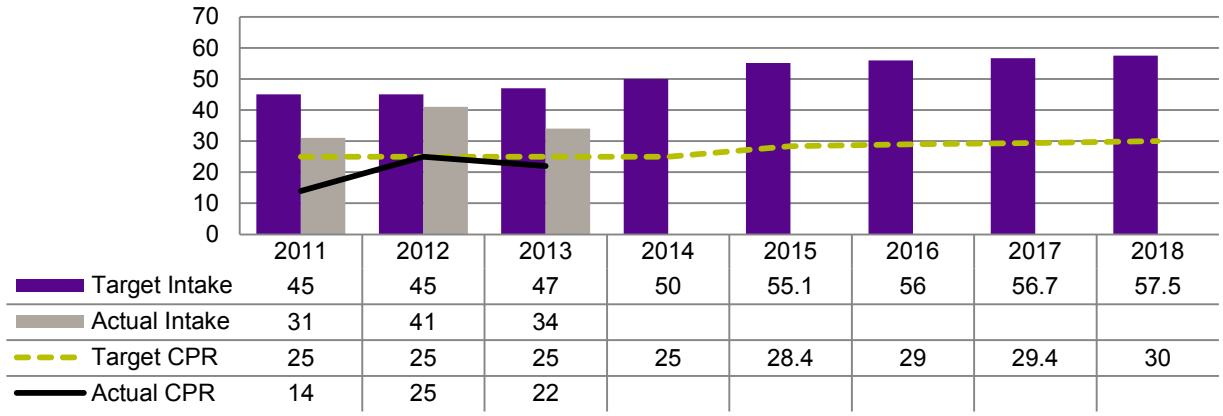
Provide support for capstone entrepreneurship awards

- Conrad is offering program support and staffing for the entrepreneurship awards described in Section III.H.

C. GRADUATE STUDIES PLAN

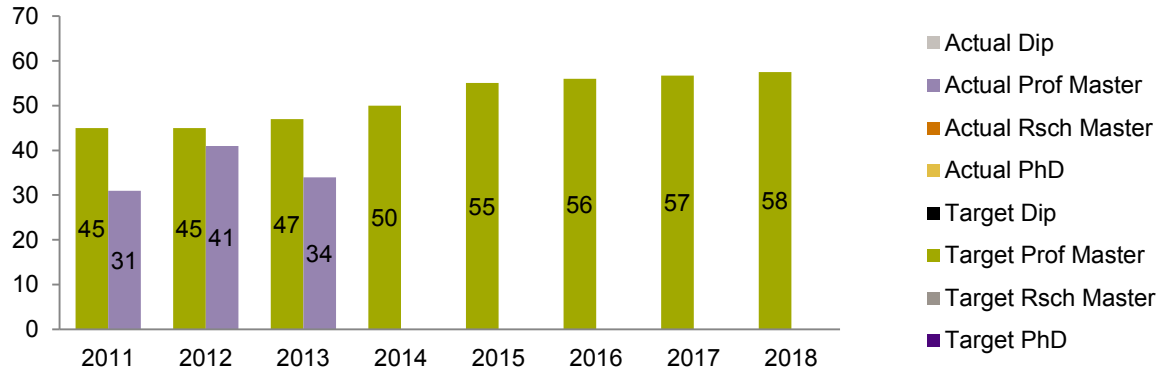
- The graduate intake targets in Figure 40 and Figure 41 have been updated to remove programs that will no longer be launched (see below) and to add projected intake for the part-time MBET starting in May, 2015.
- Because enrolments in the Diploma in Business and Entrepreneurship have been limited to students registered concurrently in other professional master programs, the program has been removed from Conrad's graduate student targets.

Figure 40: CONRAD Graduate Intake Plan Performance to Target by Visa Status



	2011	2012	2013	2014	2015	2016	2017	2018
Target Intake	45	45	47	50	55.1	56	56.7	57.5
Actual Intake	31	41	34					
Target CPR	25	25	25	25	28.4	29	29.4	30
Actual CPR	14	25	22					

Figure 41: CONRAD Graduate Intake Plan Performance to Target by Program Type



Enhance MBET program

- A variety of initiatives are underway to enhance the MBET program, including renewed focus on utilizing our alumni network, recruitment of outstanding sessional faculty to complement our core faculty competencies (e.g., in social entrepreneurship), and a program review process.

Launch Master of Business, Intrapreneurship and Innovation (MBII) degree

- Conrad now targets a September, 2015 launch for this program, re-positioned as our part-time MBET program. MBET program growth was premised on the launch of this program.

Launch Master of Product Management (MPM) degree

- After a market analysis and consideration of the academic underpinnings of such a degree, it was decided not to pursue this further.

Offer Diploma in Business and Entrepreneurship to students in MEng degree programs

- Six courses a year are now being offered. They have been well-received, and have generally filled in each term. Indications are that there may be greater demand than we can currently accommodate.
- Enrolments in these courses to date have been dominated by students pursuing the Certificate in Business and Entrepreneurship as part of their studies in a professional master program elsewhere in the Faculty of Engineering. We do not anticipate significant enrolment in the stand-alone diploma program separately.

Develop a strategic marketing plan to ensure graduate intake targets are met

- All indications are that Conrad's new approach to marketing – with heavy emphasis on Google campaigns, webinars, and social media – will yield a significant increase in MBET student numbers.

Explore opportunities for additional taught master's programs to launch in 2015-2020 period

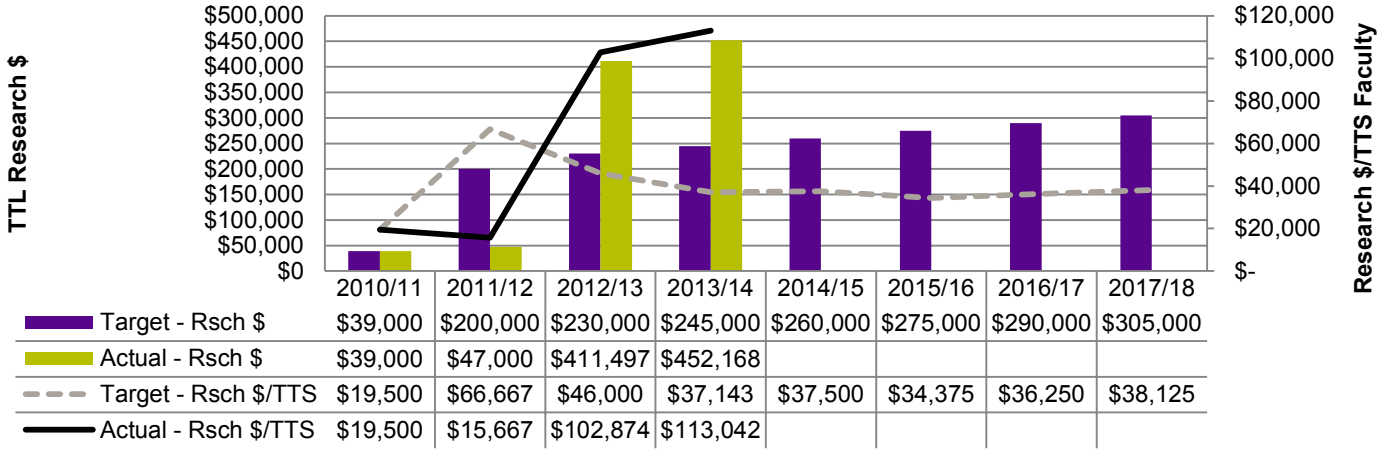
- Our current focus is on the core MBET offering and the design of a new part-time MBET program.

Plan for introduction of research-based master's and/or PhD program in the 2015-2020 period

- There has been no progress on this objective, and it is not seen as a priority in the coming year.

D. RESEARCH PLAN

Figure 42: CONRAD Research Funding Plan Performance to Target



	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Target - Rsch $	$39,000	$200,000	$230,000	$245,000	$260,000	$275,000	$290,000	$305,000
Actual - Rsch $	$39,000	$47,000	$411,497	$452,168				
Target - Rsch $/TTS	$19,500	$66,667	$46,000	$37,143	$37,500	$34,375	$36,250	$38,125
Actual - Rsch $/TTS	$19,500	$15,667	$102,874	$113,042				

Grow Conrad's research capacity and reputation

- The addition of tenure-stream faculty is helping in this regard. However, our current focus on significant program review and development places some downward pressure on research capacity.

Cultivate a research culture that is balanced between contribution to scholarship and industry relevance

- All individual faculty at Conrad are doing a very fine job of balancing scholarship and industry relevance.
- We anticipate the development of a vibrant collective research culture to be enhanced as open tenure-stream positions are filled.

E. DEVELOPMENT PLAN

- No report this year.

F. GOVERNANCE, ADMINISTRATION & LEADERSHIP PLAN

Complete transition from independent research centre to school within the Faculty of Engineering

- It has not been possible to move this agenda forward during a period of leadership transition. We hope to see progress on this goal in the coming year.

Electrical & Computer Engineering Department

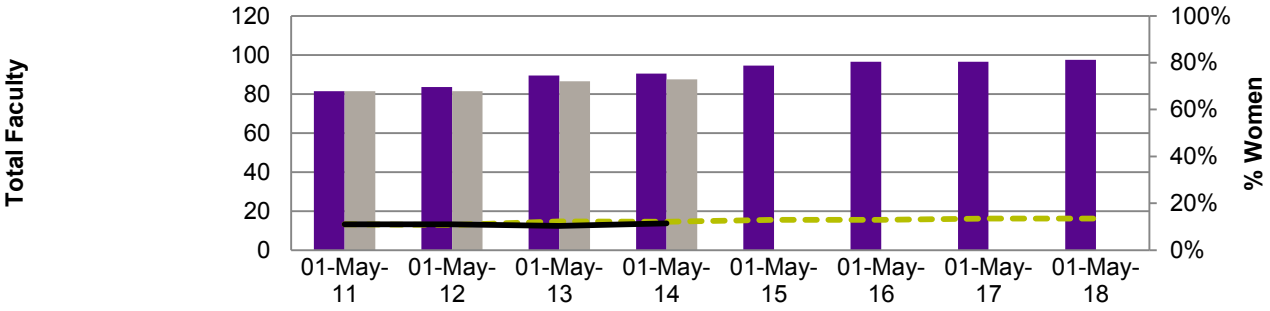
Manoj Sachdev, Chair

The Department of Electrical & Computer Engineering (ECE) went through a period of rapid growth in the previous (Vision 2010) plan. Therefore, in this plan our overarching objective is to focus on consolidation and all-around academic excellence. In 2013/14, ECE continued its steady progress towards its Vision 2015 targets. In spite of annual budget cuts in the department's operating account and its associated impact on our operation, the department made substantial progress towards its targets.

A. FACULTY AND STAFF PLAN

- ECE hired three professors: Lan Wei (Devices), Werner Dietl (Software), Michal Bajcsy (IQC/ECE) in 2013/14.
- Adam Neale (first-year lecturer) is expected to start in fall 2014.
- There are six searches ongoing including a Tier 1 Canada Research Chair on big data. Hiring of at least two faculty members, including the Graduate Attributes Lecturer, will be completed this coming year.
- Two faculty members, Sujeet Chaudhuri and Adel Sedra, retired after long and meritorious service including serving as Dean of Engineering. They remain active within the department doing research and teaching. The department anticipates several additional retirements in the next two years.
- Hiring of female faculty members continues to be a challenge in ECE disciplines. In spite of our proactive efforts, we hired only one female faculty member in the past year.

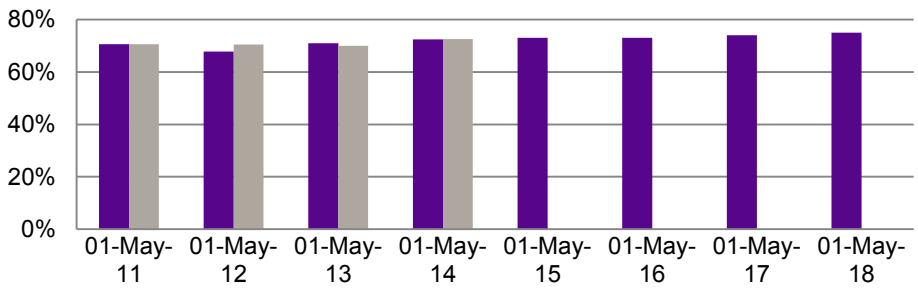
Figure 43: ECE Regular Faculty Complement Plan Performance to Target



	01-May-11	01-May-12	01-May-13	01-May-14	01-May-15	01-May-16	01-May-17	01-May-18
Target Total	81.5	83.5	89.5	90.5	94.5	96.5	96.5	97.5
Actual Total	81.5	81.5	86.5	87.5				
Target % Women	11.0%	10.8%	12.3%	12.2%	13.0%	13.0%	13.5%	13.5%
Actual % Women	11.0%	11.0%	10.4%	11.4%				

- We are actively encouraging faculty members to register as professional engineers (PEng) in Ontario. The proportion of faculty who are registered and/or have applied for PEng is likely to improve as we require new hires to apply for the PEng status as soon as possible.

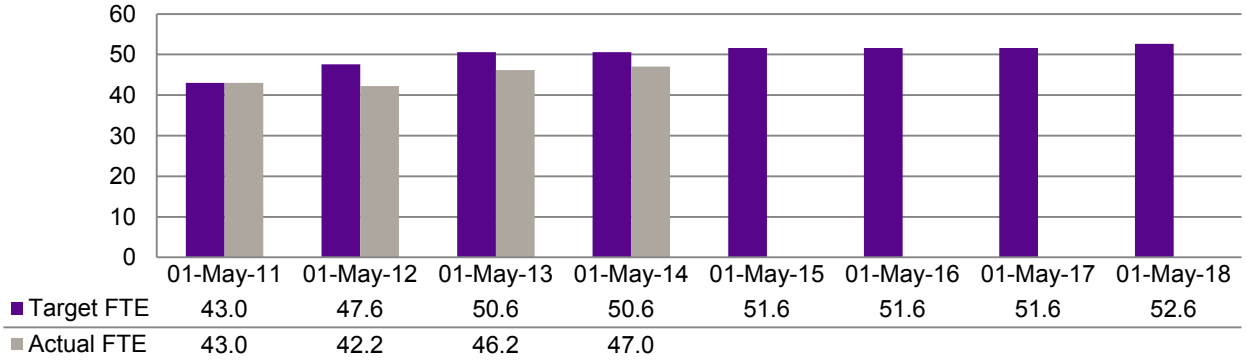
Figure 44: ECE Regular Faculty PEng Status Performance to Target



	01-May-11	01-May-12	01-May-13	01-May-14	01-May-15	01-May-16	01-May-17	01-May-18
Target % Registered&Applied	70.6%	67.7%	70.9%	72.4%	73.0%	73.0%	74.0%	75.0%
Actual % Registered&Applied	70.6%	70.5%	69.9%	72.6%				

- In 2013/14, ECE filled one administrative staff vacancy and two technical staff vacancies.
- A reorganization of administrative staff was completed to provide better student service and undertake increased responsibilities by redistributing staff resources. In order to meet additional legislative and financial compliance requirements a specialist role was created to co-ordinate non-faculty and visiting appointments and to support faculty research activities. Five administrative positions were reclassified.
- ECE encourages staff learning opportunities: one staff member was temporarily reassigned to support software engineering undergraduate students during a leave period; several staff members pursued professional development certificates to prepare for succession planning and cultivate managerial skills; and a career path was created for Lab Instructors.

Figure 45: ECE Staff Complement Plan Performance to Target

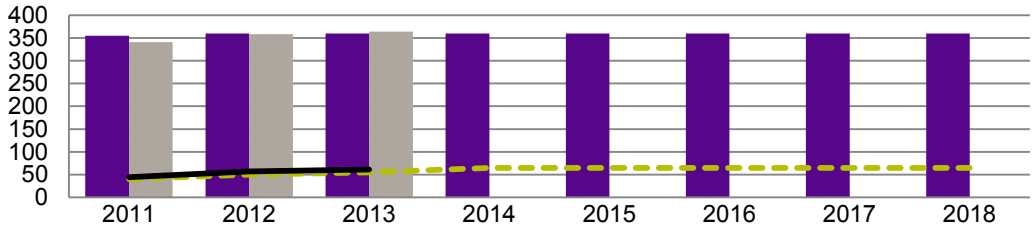


	01-May-11	01-May-12	01-May-13	01-May-14	01-May-15	01-May-16	01-May-17	01-May-18
Target FTE	43.0	47.6	50.6	50.6	51.6	51.6	51.6	52.6
Actual FTE	43.0	42.2	46.2	47.0				

B. UNDERGRADUATE STUDIES PLAN

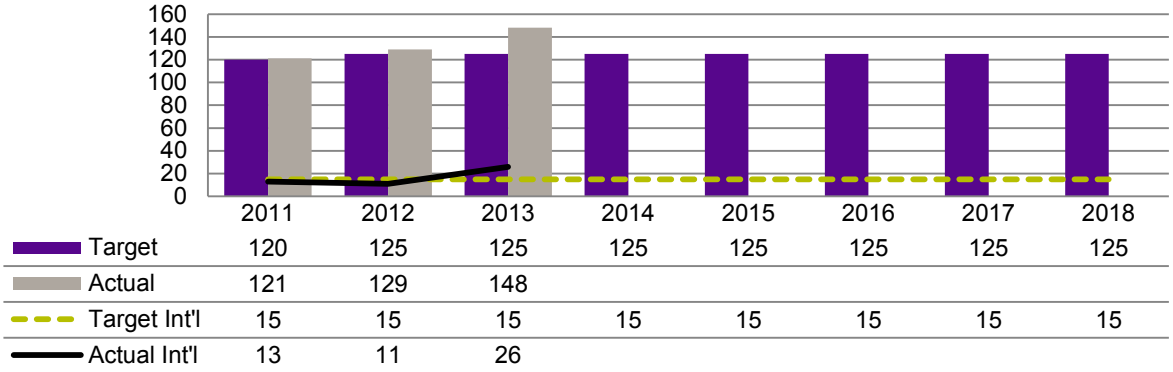
ECE is responsible for 2,146 undergraduate students, a 3.5% increase from the 2010/11 benchmark. We manage three combined cohorts of students enrolled in Electrical Engineering (EE) and Computer Engineering (CE) and participate in three collaborative engineering programs: Software Engineering (SE) with a 50% share, Mechatronics Engineering (MTE) with a 20% share, and Nanotechnology Engineering (NE) with a 33% share of students. We will also be participating in the new Biomedical Engineering program.

Figure 46: EE&CE Undergraduate Intake Plan Performance to Target



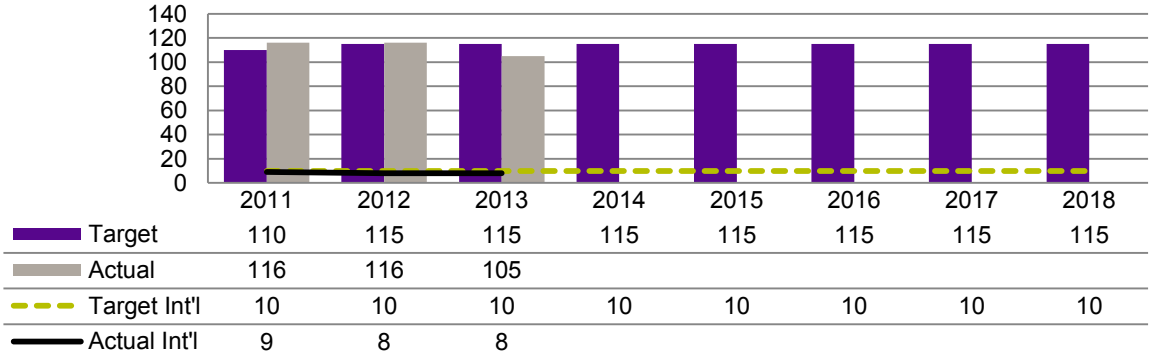
	2011	2012	2013	2014	2015	2016	2017	2018
Target	355	360	360	360	360	360	360	360
Actual	341	358	364					
Target Int'l	40	50	55	65	65	65	65	65
Actual Int'l	44	57	61					

Figure 47: SE Undergraduate Intake Plan Performance to Target



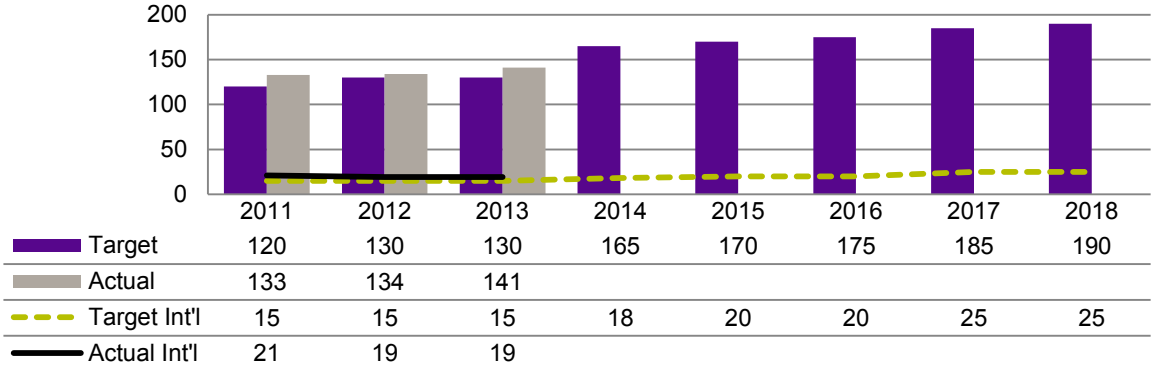
	2011	2012	2013	2014	2015	2016	2017	2018
Target	120	125	125	125	125	125	125	125
Actual	121	129	148					
Target Int'l	15	15	15	15	15	15	15	15
Actual Int'l	13	11	26					

Figure 48: NANTE Undergraduate Intake Plan Performance to Target



	2011	2012	2013	2014	2015	2016	2017	2018
Target	110	115	115	115	115	115	115	115
Actual	116	116	105					
Target Int'l	10	10	10	10	10	10	10	10
Actual Int'l	9	8	8					

Figure 49: MCTR Undergraduate Intake Plan Performance to Target



	2011	2012	2013	2014	2015	2016	2017	2018
Target	120	130	130	165	170	175	185	190
Actual	133	134	141					
Target Int'l	15	15	15	18	20	20	25	25
Actual Int'l	21	19	19					

Enhance the quality of admitted students in Electrical and Computer Engineering

- The overall quality of the incoming students appears to be improving, as evidenced by increasing high school averages and improved success rates in the first-year program.
- We continue to pool EE and CE students to help ensure that we admit the best students.
- We have been gradually increasing the proportion of visa students in each admitted class. In 2013/14, visa student intake exceeded target, reaching about 17% of the incoming class (up from 9.8% in 2010/11).

Improve student retention rates and enhance student engagement

- A new lecturer has been hired to help with 1A retention initiatives beginning in fall 2014.
- During winter 2014, ECE ran a pilot study using 10 fourth-year ECE students as general TAs for lower-year courses. We found that the pool of qualified and interested senior undergraduate students was quite small and that usage of the TAs was limited despite several announcements to the lower-year classes. Alternatives will be explored in the future.

- To help bolster student engagement through effective funding of student design teams and events, ECE has introduced a formal process for funding requests for design project groups and for community-building events.
- We yet require a systematic way to determine when and why students transfer out of ECE.

Enhance the undergraduate student experience through infrastructure improvements

- A new 400-nasm ECE student space opened in E2, near all undergraduate labs, in winter 2014.
- ECE continues to use a $2.2M allocation from the Vision 2015 Undergraduate Laboratory Enhancement Fund to upgrade all of our undergraduate labs. Despite this impressive improvement, we remain concerned that in the absence of permanent lab budget, lab infrastructure may become obsolete in a decade.

Improve overall teaching quality

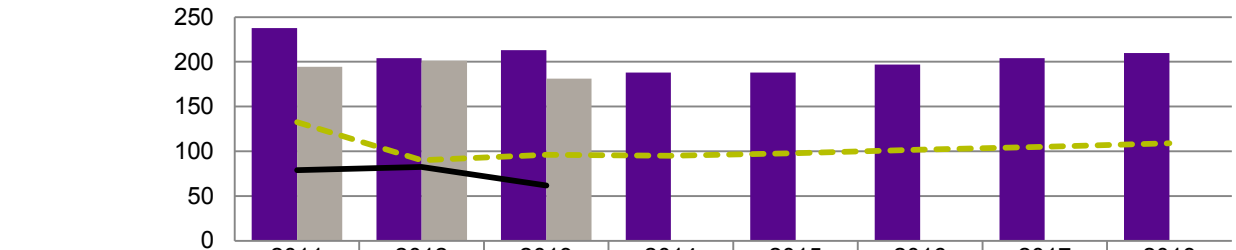
- ECE's continual-improvement outcomes-based assessment process, mandated by CEAB, has been fully implemented as of 2013/2014.
- Our Teaching Quality Co-ordinator (TQC), Prof. David Wang, works closely with instructors and others in the university (including the Associate Dean of Teaching and experts at the Centre for Teaching Excellence) to determine best practices for teaching and to assist individual instructors.
- The TQC chairs three meetings each term in which student representatives and instructors discuss the courses being taught in that term, to provide two-way communication and deal with specific problems quickly.
- The TQC sits in on all sessional instructor interviews.
- For several terms we have tried to hire senior undergraduate ECE students as TAs, but we found that there were few capable students who were willing to spend their co-op terms as TAs.
- Due to time limitations associated with the lab equipment upgrade and accreditation, the planned systematic lab review to ensure streamlined content with clear purposes and reasonable workload has been delayed.

C. GRADUATE STUDIES PLAN

The ECE graduate program at Waterloo is one of the largest in the country, with 602 graduate students in 2013.

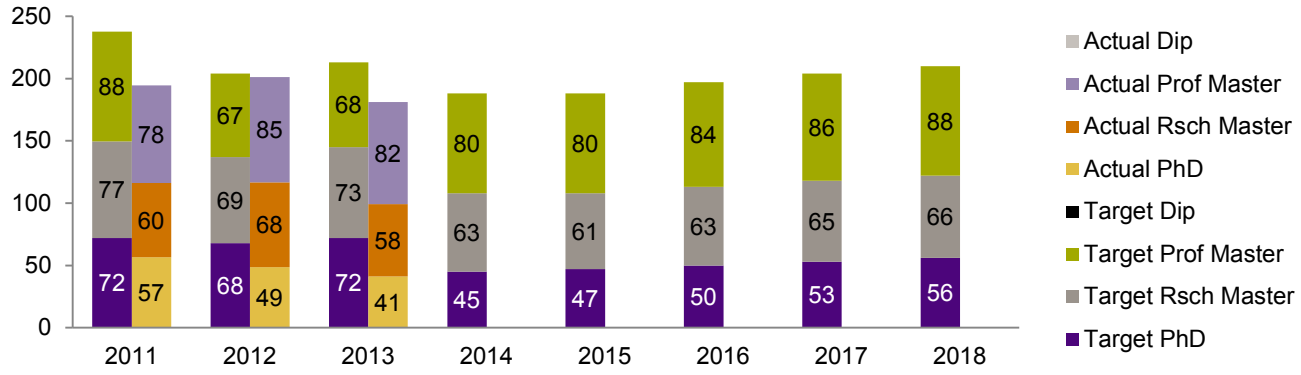
- Our course-based master target has been exceeded whereas our research master and PhD programs have failed to meet targets. The PhD target was not met due to the large number of deferred admissions caused by unforeseen delays. Our research master had a significant increase in admissions a year ago; hence this drop may just be a balancing effect.
- From 2012 to 2013, the overall number of CPR PhD students remained constant. However, PhD international student intake was down by 11% in 2013, likely due to many students being forced to defer their admissions one or two terms due to unforeseen delays caused by the Canadian Immigration strike in summer 2013.
- Overall the master's programs had a drop of 28% in CPR students, while the course-based master's program has seen a steady increase in admissions over the past five years, with an increase of 15% in the last year.

Figure 50: ECE Graduate Intake Plan Performance to Target by Visa Status



	2011	2012	2013	2014	2015	2016	2017	2018
Target Intake	237.6	204	213	188	188	197	204	210
Actual Intake	194.4	201.3	181.1					
Target CPR	132.5	90	96	95	98	102	105	109
Actual CPR	79.1	82.5	61.8					

Figure 51: ECE Graduate Intake Plan Performance to Target by Program Type



Increase the rigour of the PhD examination

- Following many discussions at department meetings and a retreat, ECE approved details of splitting the comprehensive exam into a background exam (first year) and a thesis proposal examination (second year). This change is expected to become effective in September, 2015 following Faculty and University approval.

Provide high-quality PhD supervision and support timely degree completion

- ECE recently approved rescheduling of the PhD milestones in order to improve their quality of supervision and the research environment by ensuring all PhD students will receive additional feedback from one or more PhD examining committee members each year throughout their program. This will be subject to University approval and should be in effect for fall 2015.
- The ECE Graduate Studies Committee will develop a guideline for ECE graduate supervision.

Increase graduate course requirements

- Effective for graduate students admitted in fall 2014 and onward, each research master or PhD student must complete at least two core courses within their area of specialization during their program. Additionally all PhD graduate students must complete an extra graduate course.

Increase recruitment efforts to attract CPR students and improve graduate funding

- ECE makes significant investments in graduate funding: approximately $300,000/year in the past two years to subsidise CPR graduate students; over $550,000/year towards TAs in addition to the TA money received from the centre; five TA awards each term; and 15 ECE graduate scholarship awards each term, the value of which was increased to $1,250 in 2013.

Restructure the MEng program with a focus on quality

- During the last two years, ECE has tightened its admissions criteria for the MEng program. Recent graduate course GPAs of MEng students indicate very good academic averages with lower standard deviations.
- Two new ECE courses were offered in fall 2013 to help incoming MEng students and other graduate students improve their background skills in general engineering analysis and software engineering areas.

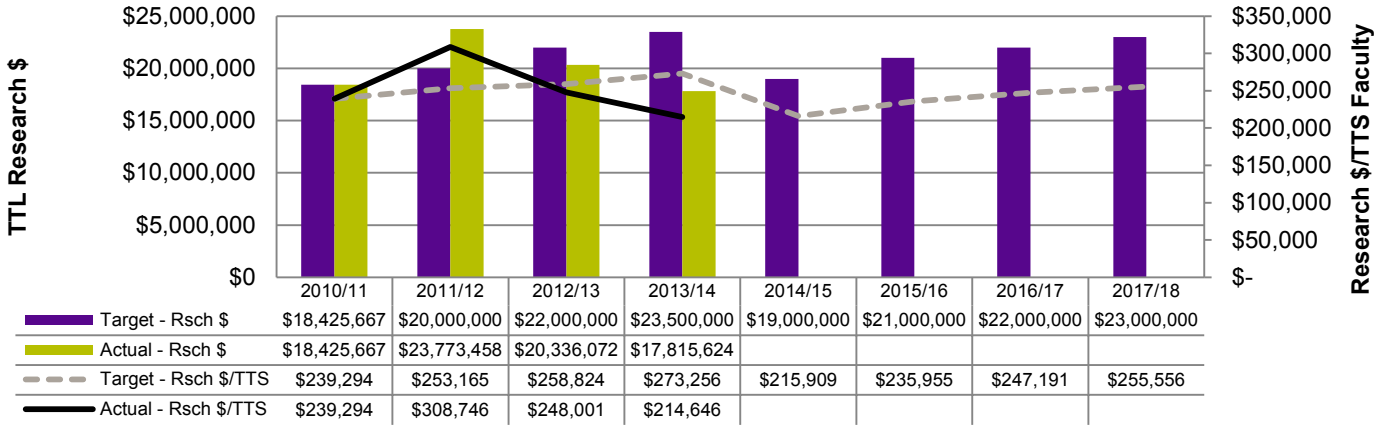
Improve the graduate student experience

- An ECE graduate studies manual will be given to all new graduate students in fall 2014, outlining the program, funding, TAships, and other essential information.
- The Graduate Studies Committee includes a GSA ECE student representative in order to ensure that student opinions and feedback are taken into consideration.

D. RESEARCH PLAN

ECE received $17.8M in research funding in 2013/14, which is 12% lower than 2012/13. This is consistent with the reduction of funding that other engineering departments at Waterloo and other ECE departments in Ontario have seen in 2013. The primary reason appears to be cutbacks in provincial funding sources and reduction of industrial funding. However, the ECE research environment is strong and diversified. In view of the CFI and ORF proposals that were submitted this year, we expect that we will have positive trend as of 2015/2016. We have accordingly revised the targets for research funding over the next four years to more realistic values.

Figure 52: ECE Research Funding Plan Performance to Target



	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Target - Rsch $	$18,425,667	$20,000,000	$22,000,000	$23,500,000	$19,000,000	$21,000,000	$22,000,000	$23,000,000
Actual - Rsch $	$18,425,667	$23,773,458	$20,336,072	$17,815,624				
Target - Rsch $/TTS	$239,294	$253,165	$258,824	$273,256	$215,909	$235,955	$247,191	$255,556
Actual - Rsch $/TTS	$239,294	$308,746	$248,001	$214,646				

Increase the department's research visibility

- Our two Distinguished Lecture Series speakers last year were Prof. Roger Howe from Stanford University and Prof. R. Srikant from University of Illinois at Urbana Champaign. These events attract attendees from other institutions and local companies.
- ECE purchased a wall-mount computer with a large interactive display for the department reception area, to display department activities such as highlights of undergraduate capstone design projects and research labs.

Improve research quality

- We continue to provide a Department Research Award to up to two faculty members each year.

Improve the department's research profile

- Reflecting our ongoing active support for faculty nominations to various national and international awards, an ECE faculty member received the Steacie award and another became a Fellow of the IEEE in 2014.
- Over the last year we posted more than 18 news items highlighting faculty achievements on the ECE website.

Increase research funds

- Over the last year, three presentations were given by the Associate Chair, Research to promote ECE research capabilities to industrial organizations visiting the University.

Improve the research environment

- The departmental Health and Safety Committee has implemented a proactive agenda to improve the safety culture and environment within ECE labs and research centres.

E. RECRUITMENT AND OUTREACH PLAN

Improve deployment of ECE outreach efforts

- The ECE Recruitment Co-ordinator is preparing an outreach event calendar to allow faculty and staff to more effectively plan their participation in upcoming outreach events in advance.

Increase participation in existing outreach activities

- Departmental participation in major Faculty of Engineering outreach initiatives has remained steady.
- A key objective remains the development of ECE-themed modules for Engineering Science Quest (Grades 1 to 9), Catalyst Weekend Conference (Females, Grade 11), and GoEngGirl.

Increase alumni and undergraduate participation

- Undergraduate participation, through partnership with the Engineering Ambassador program, has increased significantly. We now have a dedicated and trusted team of volunteers that help organize events, deliver tours and act as the face of the department to visitors and prospective students.
- Accommodating alumni work schedules for outreach participation remains a challenge.

Develop ECE student design teams

- This year ECE has provided over $6,000 in funding as well as technical support through our talented faculty and staff to student design teams, including: UW Nanorobotics team (Winner of 2013 Mobile Microrobotics Challenge International Conference on Robotics and Automation in Karlsruhe, Germany), WATSAT- UW Micro-Satellite Team (2nd place at Canadian Satellite Design Challenge in October, 2013), Waterloo Aerial Robotics Group, and UW Electric Motor Sports Team.
- In 2014 we sponsored and supported various events aimed at increasing student morale including: 3A Computer Engineering Hackathon Competition, ECE student participation in the NSPIRE student conference, class social events like paintball and barbeques, and the Engineering Graduation Committee.
- The ECE department is a proud, continuing, sponsor of the Go ENG Girl program aimed at increasing female enrolment in engineering programs.

F. ANNUAL ASSESSMENT AND CALIBRATION

A full-day retreat was organized in April 2014 to discuss various departmental issues, including ECE's progress on Vision 2015. At the undergraduate level, we discussed strategies to reduce attrition in EE and CE programs, as well as to enhance student engagement and to explore incorporating entrepreneurship into our undergraduate programs. At the graduate level, we discussed strategies to enhance quality of instruction for graduate students, including increasing the course requirement for PhD students and enhancing the qualifying examination for PhD students. As for research, the department discussed existing department procedures for facilitating research. In addition, we discussed a proactive approach to nominate ECE faculty for national and international awards.

Management Sciences Department

Frank Safayeni, Outgoing Chair

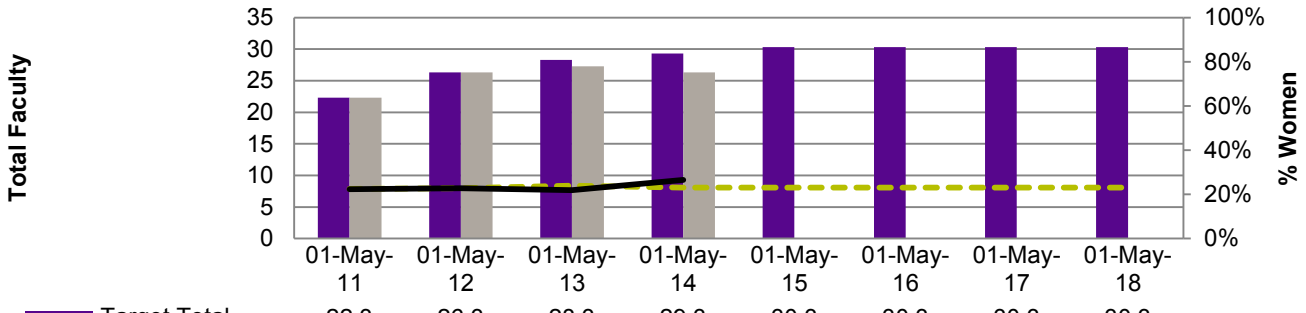
This report was prepared by Frank Safayeni at the end of his term; at the time of publication, the Chair of Management Sciences is now Samir Elhedhli.

In the past year, having decided to participate in the CEAB review a year early to co-ordinate with the rest of Engineering, we successfully received accreditation for our undergraduate program for six years. Our graduate program also received an excellent review from external assessors.

A. FACULTY AND STAFF PLAN

- Since the May 1, 2014 count date reflected in Figure 53, we have hired one new faculty (Prof. Alumur Alev) who starts in September, 2014 and had one resignation (Prof. Vanessa Bohns in June, 2014).
- We have advertised for three positions for 2014/2015, including the Graduate Attributes Lecturer position, and anticipate two additional replacement positions to fill in 2015/2016.
- In the next two years we also expect two faculty retirements.

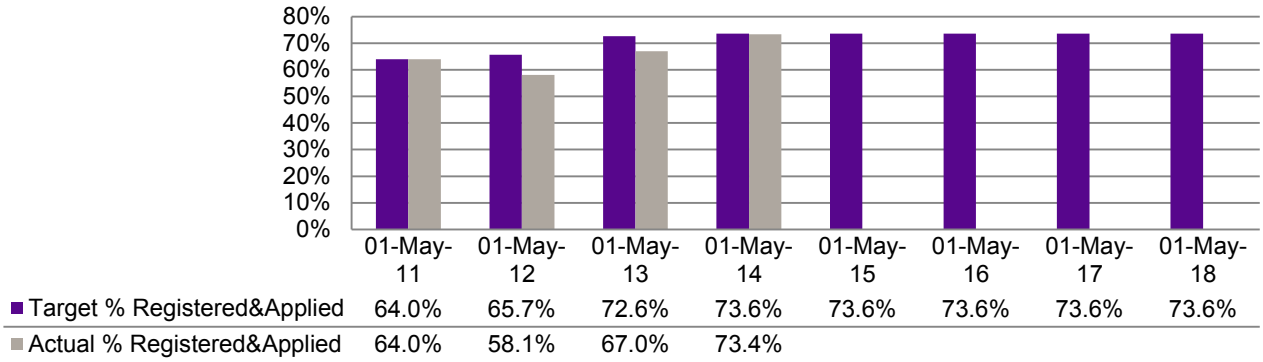
Figure 53: MSCI Regular Faculty Complement Plan Performance to Target



	01-May-11	01-May-12	01-May-13	01-May-14	01-May-15	01-May-16	01-May-17	01-May-18
Target Total	22.3	26.3	28.3	29.3	30.3	30.3	30.3	30.3
Actual Total	22.3	26.3	27.3	26.3				
Target % Women	22.5%	22.9%	23.9%	23.1%	23.1%	23.1%	23.1%	23.1%
Actual % Women	22.4%	22.8%	22.0%	26.6%				

- We are on target with respect to registered PEng in our department. All those faculty members who could register either have obtained their PEng or are in the application process.

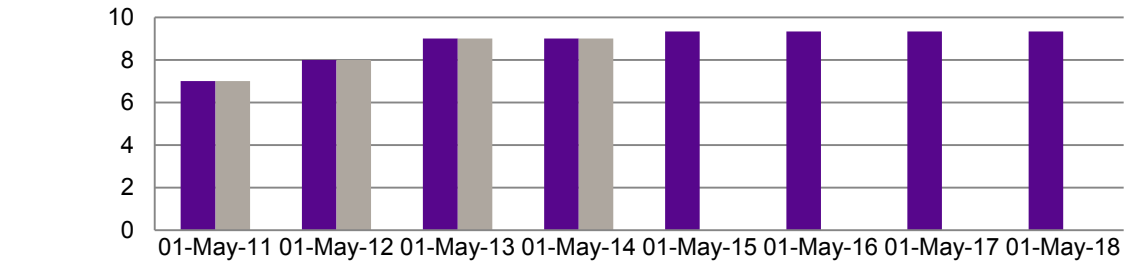
Figure 54: MSCI Regular Faculty PEng Status Performance to Target



	01-May-11	01-May-12	01-May-13	01-May-14	01-May-15	01-May-16	01-May-17	01-May-18
Target % Registered&Applied	64.0%	65.7%	72.6%	73.6%	73.6%	73.6%	73.6%	73.6%
Actual % Registered&Applied	64.0%	58.1%	67.0%	73.4%				

- We remain on target with respect to staff; the only expected change will be the planned 0.33 FTE position to support the administration of outcomes-based data.

Figure 55: MSCI Staff Complement Plan Performance to Target



	01-May-11	01-May-12	01-May-13	01-May-14	01-May-15	01-May-16	01-May-17	01-May-18
Target FTE	7.0	8.0	9.0	9.0	9.3	9.3	9.3	9.3
Actual FTE	7.0	8.0	9.0	9.0				

Faculty high performance

- Prof. Ken McKay, Associate Chair, Teaching, has been working with faculty on course content and delivery.
- We have reduced the teaching load from four to three for those faculty members who are either supervising many students or are actively working on several research grants.
- We offer an orientation program and assign a mentor for all new faculty.

Staff high performance

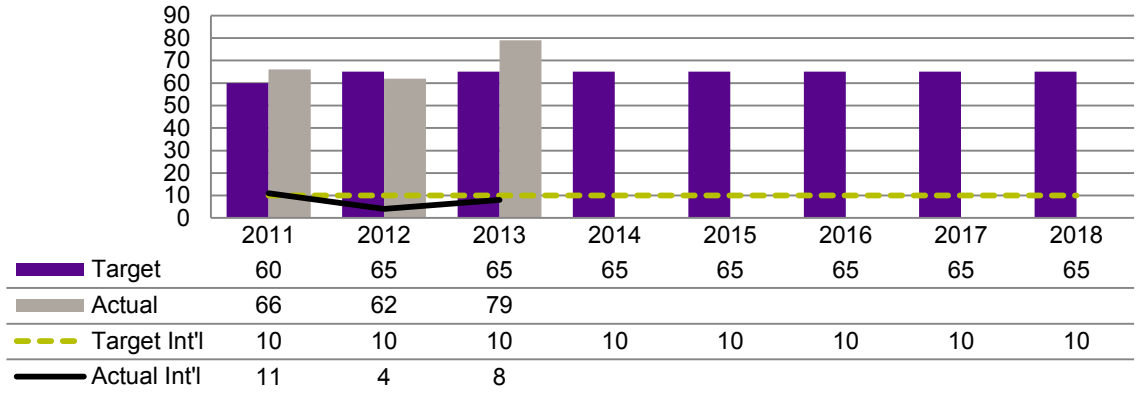
- The Administrative Officer is working to review and update all staff job descriptions.
- We have promoted better faculty-staff relationships through regular social events.

Department information tracking tool development

- We have made progress by working with ECE to implement their system in our department and have also developed a system to make data collection for outcomes-based assessment easier.

B. UNDERGRADUATE STUDIES PLAN

Figure 56: MGMT Undergraduate Intake Plan Performance to Target



	2011	2012	2013	2014	2015	2016	2017	2018
Target	60	65	65	65	65	65	65	65
Actual	66	62	79					
Target Int'l	10	10	10	10	10	10	10	10
Actual Int'l	11	4	8					

Implement outcomes-based program evaluation

- The implementation of the outcomes-based plan is ongoing and on schedule. A faculty member (50%) and a staff member (33%) will be hired to work on outcomes-based program evaluation and program improvement on a regular basis. Hiring of the two members will be completed in 2015.

Reduce student attrition by increasing student admission averages

- We continue to maintain a stable intake and are working to increase student admission averages.

Increase the average teaching quality of faculty and TAs

- We have implemented a new TA application system, providing more information for instructors to select TAs.
- An instructor has been appointed to organize the evaluation of work-term reports, to improve report quality.

Enhance the social, professional, and intellectual experience of our students

- The Waterloo IIE Student Chapter is working effectively to organize student events including MEET and the Annual Student IIE Conference.
- The chapter will organize the 2016 Annual Student IIE Conference in Waterloo.

Expand MSCI Option course offerings

- Due to a resignation, we had to delay offering the planned new Leadership and Influence course.

Acquire additional space for a larger undergraduate laboratory

- We are still developing our undergraduate lab. At this point additional space is not our main concern, although the increase in students (due to exceeding targets) has created problems for scheduling labs.

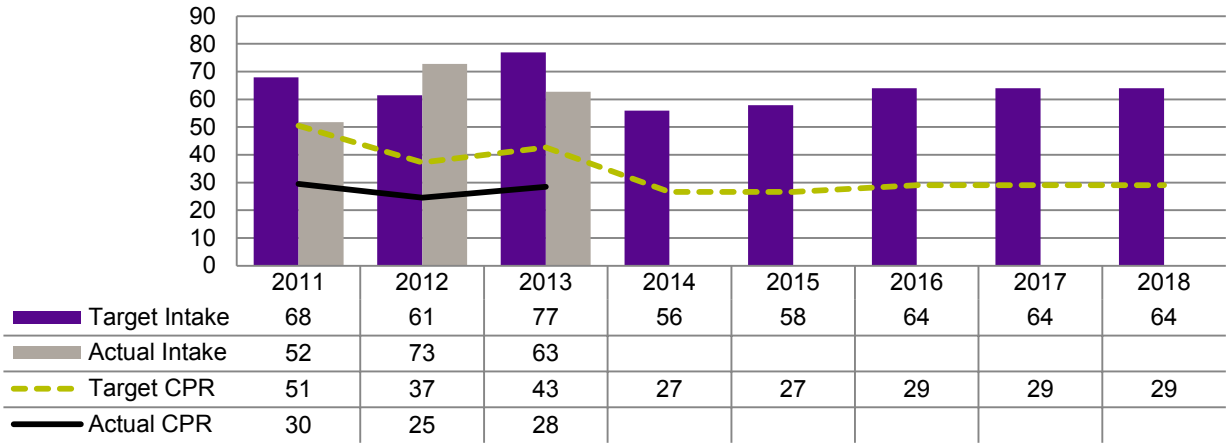
Undergraduate program review

- A new priority for the department is to conduct a comprehensive review of our undergraduate program and make adjustments based on what we have learned in the last eight years.

C. GRADUATE STUDIES PLAN

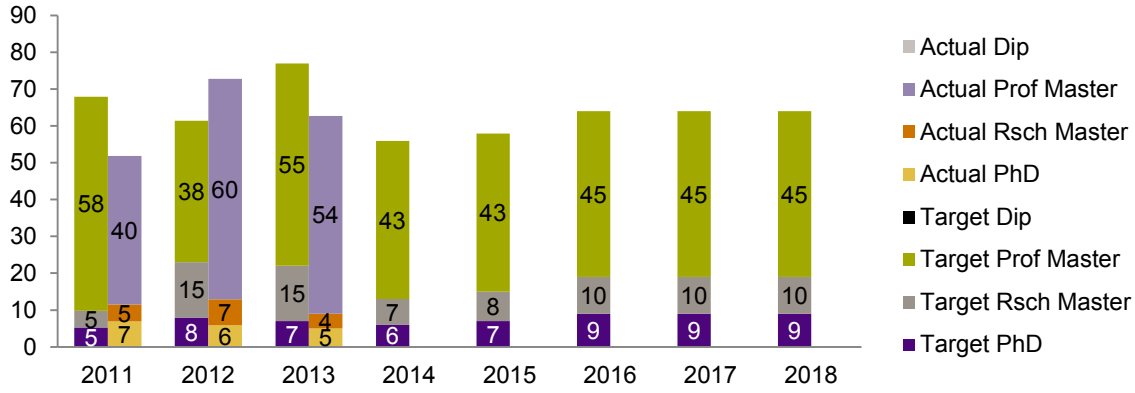
- Figure 58 shows a continuing strong demand for on-campus and online coursework master (MMSc) programs. Research master and PhD intakes are steady or increasing as we add new faculty and their research programs get started, but funding constraints hamper our ability to reach target.
- Figure 57 shows a continuing difficulty in meeting targets for CPR students, which is a particular challenge in the research master and PhD programs. Funding constraints contribute to this problem, but another factor is our slow admissions process, which allows other universities to make offers to highly qualified CPR applicants before we do. To address this issue in 2014, we considered the CPR applications first.
- We have adjusted our targets to reflect our current context and recent experience.

Figure 57: MSCI Graduate Intake Plan Performance to Target by Visa Status



	2011	2012	2013	2014	2015	2016	2017	2018
Target Intake	68	61	77	56	58	64	64	64
Actual Intake	52	73	63					
Target CPR	51	37	43	27	27	29	29	29
Actual CPR	30	25	28					

Figure 58: MSCI Graduate Intake Plan Performance to Target by Program Type



Reducing graduate class sizes and increasing graduate course availability

- Because the graduate foundation courses are very large, we may split some into two sections each to the extent we can, given competing needs for the use of available teaching tasks.
- As we hire and new faculty get to full teaching load the number of on-campus graduate courses is increasing. From 2011/12 to 2013/14, graduate courses increased from 21 to 24.

Facilitating transfers between the course work and the thesis programs

- Transfers from the MMSc to MASc has been a larger source of MASc students than intake directly into MASc

Increasing student funding level

- Efforts to increase the number of MASc students has been stopped as a result of funding requirements in Engineering. We are negotiating the possibility of using TA funding as a source of graduate student support.
- We are pursuing several ways to increase the graduate student funding available, by: encouraging and rewarding increased faculty research activity, including through reduced teaching loads (three courses instead of 4) for research-active faculty; increasing industry liaison activity; and using funds from the online program to provide significant help in supporting research students. We would like to offer MMSC programming overseas, which could also provide the department with additional resources. Currently we have an agreement with the Sharif University for a joint MMSc degree.

Increase participation of regular faculty in the MMSc online program and explore possibilities of combining on-campus and online courses

- As we are still behind our faculty targets, we have not been able to increase participation of regular faculty. Because few regular faculty teach online, we have only combined one on-campus and online course to date.

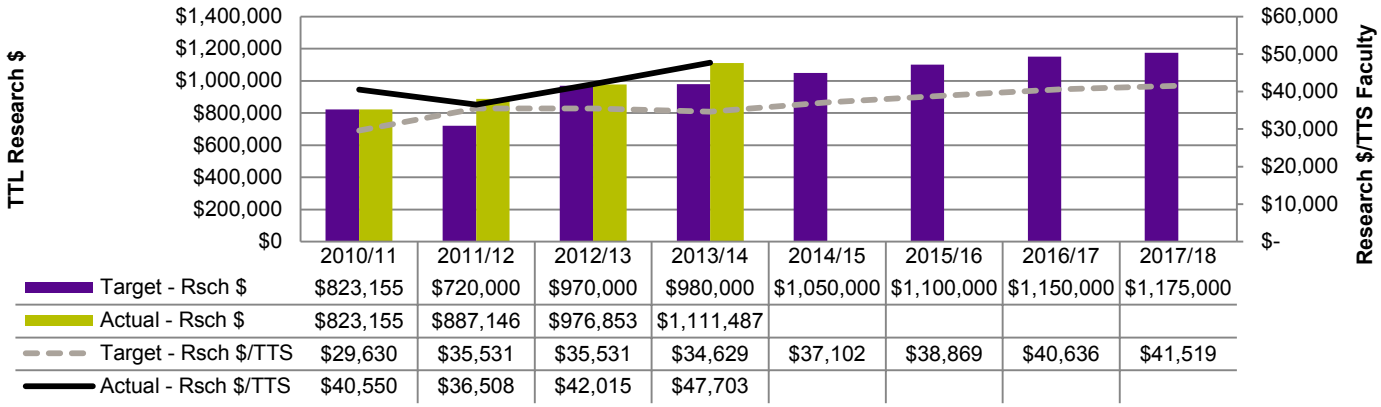
Get more frequent feedback from MMSc online students and increase social interaction with students

- Events organized to date were in Waterloo with lower than expected attendance. We are considering organizing some events in Toronto which will make attendance easier for most of our students.
- Student feedback is an area which requires more attention.

D. RESEARCH PLAN

- Our research funding has increased and surpassed target. Increasing funding remains an important objective.
- While NSERC Discovery Grants and SSHRC grants had declined due to faculty resignations, funding from industry contracts and other sources have increased significantly.

Figure 59: MSCI Research Funding Plan Performance to Target



	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Target - Rsch $	$823,155	$720,000	$970,000	$980,000	$1,050,000	$1,100,000	$1,150,000	$1,175,000
Actual - Rsch $	$823,155	$887,146	$976,853	$1,111,487				
Target - Rsch $/TTS	$29,630	$35,531	$35,531	$34,629	$37,102	$38,869	$40,636	$41,519
Actual - Rsch $/TTS	$40,550	$36,508	$42,015	$47,703				

E. INDUSTRY RELATIONS PLAN

Strengthen existing industry relationships and create new industry partnerships

- Deloitte sponsorship of the Management Engineering design symposium was renewed and expanded in 2014.
- We have increased our efforts to connect with manufacturing companies in Waterloo Region.
- Plans are underway for a Management Sciences-focused Excellence in Manufacturing Consortium local chapter meeting to be held at Waterloo in early 2015. The event will feature presentations from local manufacturers that have benefited from the Management Engineering capstone design program.

F. ADVANCEMENT PLAN

Strengthen the relationship with our growing and diverse alumni body

- A reception held following the 2014 annual design symposium had excellent Management Engineering alumni participation. Alumni also sponsored and judged an Alumni Design Project Award.

Better communicate relevant information to a variety of audiences through our web presence

- After careful research, an industry pathway was added to our website, outlining the ways industry can collaborate with MSCI through research, capstone projects, co-op, seminars, and the IIE student chapter.
- We are currently revising our undergraduate web pages to increase clarity for outside audiences.
- Integration and collaboration with the Engineering Advancement Team has improved, resulting most notably in more qualitative and cost-effective advertising of the 2014 capstone design symposium.

Mechanical & Mechatronics Engineering Department

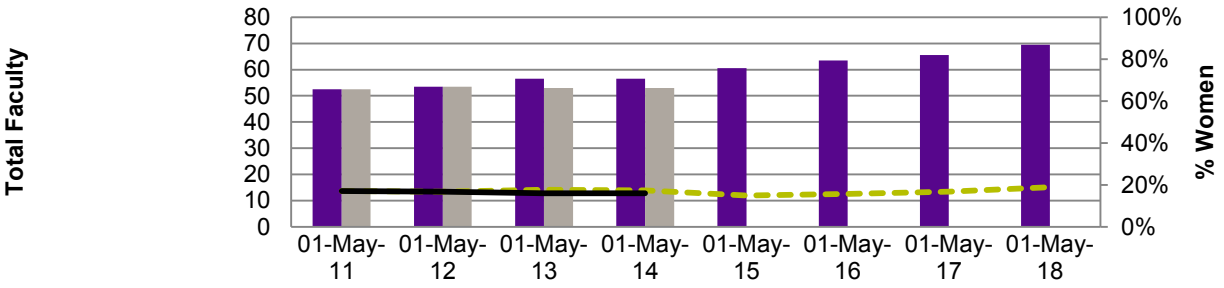
Jan Huissoon, Chair

The Department of Mechanical & Mechatronics Engineering (MME) proposed several inventive initiatives to improve the learning experience at both undergraduate and graduate levels in its Vision 2015 plan. At the undergraduate level, a major focus is on developing an engineering clinic, for which a lecturer and a lab engineer have been hired and a committee has been established to assist with planning and implementation. At the graduate level, a Diploma in Green Energy has been approved and launched. Space availability continues to be an issue, especially for our graduate students. A graduate space utilization program has been developed and implemented to better track and plan office space. Two renovation projects to create proper office and work space for four of our technical staff are at the completion stage, and will greatly improve the technical staff facilities. In summary, the initiatives we proposed are progressing well, although somewhat behind schedule.

A. FACULTY AND STAFF PLAN

- The faculty complement is below the target set for May 1, 2014 due to the starting dates of new hires falling after the count date. The May 1, 2014 complement includes Prof. Andrew Trivett, the MME Clinic Lecturer. Prof. Carol Hulls began as a Continuing Lecturer for the undergraduate Mechatronics Engineering program expansion in September, 2014. Prof. Ibrahim Khan has been hired in support of the NSERC – Trans Canada Pipelines research chair awarded to Prof. Adrian Gerlich and Prof. James Tung has been hired as Assistant Professor to replace Prof. Fathy Ismail, who retired in December, 2013.
- In the coming year we will complete the ongoing hiring process to replace one termination, hire a new lecturer to support outcomes-based assessment and the Engineering Ideas Clinic™ initiative, and hire two new faculty in the solid mechanics and design area to support the Mechatronics Engineering expansion.

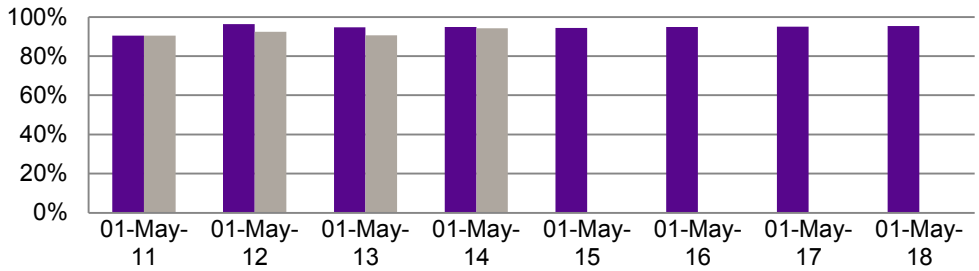
Figure 60: MME Regular Faculty Complement Plan Performance to Target



	01-May-11	01-May-12	01-May-13	01-May-14	01-May-15	01-May-16	01-May-17	01-May-18
Target Total	52.5	53.5	56.5	56.5	60.5	63.5	65.5	69.5
Actual Total	52.5	53.5	53	53				
Target % Women	17.1%	16.8%	17.7%	17.4%	15.0%	15.7%	16.8%	18.9%
Actual % Women	17.1%	16.8%	16.0%	16.0%				

- All but three MME faculty currently hold a PEng license.

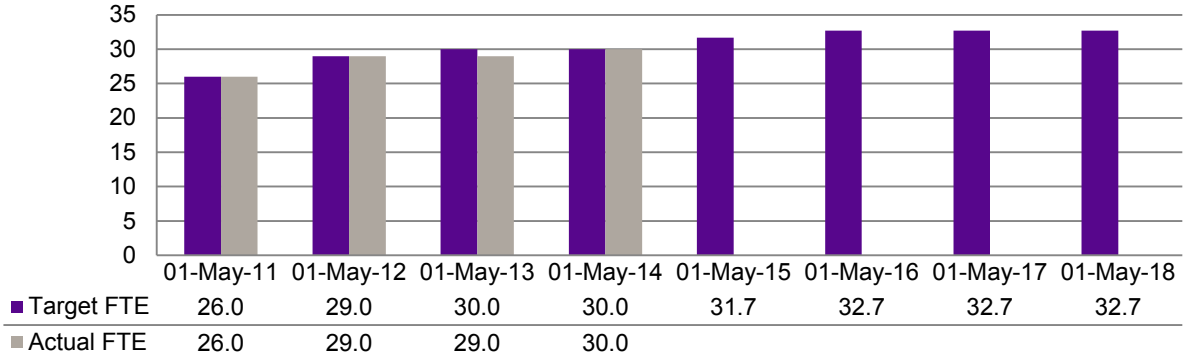
Figure 61: MME Regular Faculty PEng Status Performance to Target



	01-May-11	01-May-12	01-May-13	01-May-14	01-May-15	01-May-16	01-May-17	01-May-18
Target % Registered&Applied	90.5%	96.3%	94.7%	94.8%	94.4%	94.8%	95.0%	95.3%
Actual % Registered&Applied	90.5%	92.5%	90.6%	94.3%				

- Mr. Mark Griffett has been hired as a Laboratory Technician in the materials area, having filled the position on contract since the retirement of Mr. Norval Wilhelm; Ms. Jian Zou has been hired as Graduate Administrator to replace Ms. Lisa Baxter; and Mr. Juan Ulloa has joined the department as Laboratory Assistant.
- Priorities in the coming year include filling vacancies in the roles of Administrative Officer, Mechanical Engineering Undergraduate Advisor and department Administrative Assistant. We will also hire a new Undergraduate Program Co-ordinator in support of the Mechatronics Engineering expansion and the realignment of the undergraduate administrative support team.

Figure 62: MME Staff Complement Plan Performance to Target



Provide Professional Development and Training for our Staff

- 17 technical staff have spent a total of 526 hours in 76 professional development courses.

B. UNDERGRADUATE STUDIES PLAN

- The Mechanical Engineering (ME) and Mechatronics Engineering (MTE) programs exceeded their admission targets, both for the programs as a whole and for international students.
- The admission targets for MTE will be significantly increased with the implementation of the planned Mechatronics Engineering program expansion. These will be the same as the ME program at steady state.

Figure 63: ME Undergraduate Intake Plan Performance to Target

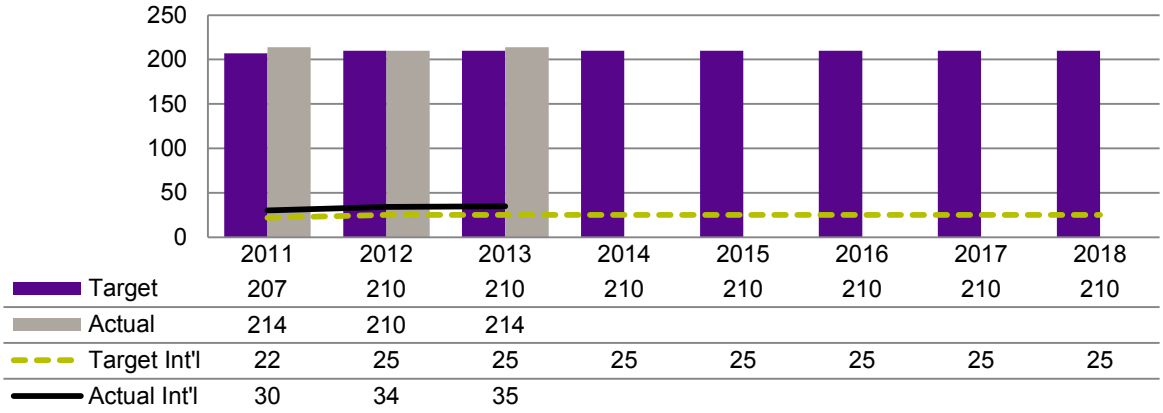
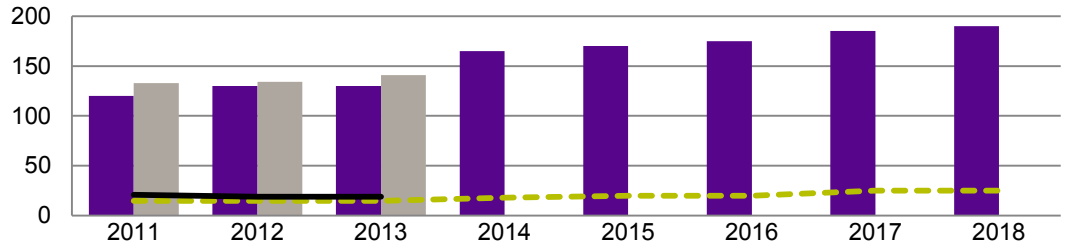


Figure 64: MCTR Undergraduate Intake Plan Performance to Target



	2011	2012	2013	2014	2015	2016	2017	2018
Target	120	130	130	165	170	175	185	190
Actual	133	134	141					
Target Int'l	15	15	15	18	20	20	25	25
Actual Int'l	21	19	19					

Establish an engineering clinic within our undergraduate programs

- Both the ME and MTE programs have several ongoing first-year clinics. New clinic activities are being developed for ME in first and second year, to be introduced in the fall 2014 term.

Improve the undergraduate experience

- The final year ME design project has been significantly revised following the first new ME481/482 offering, specifically to address the issues of how to accommodate certain student teams in the framework. The ME public exhibition of design projects held in the Sedra Student Design Centre was very successful.
- The final-year design project symposium for MTE students in winter 2014 was enhanced with an awards reception for the students and industry sponsors.

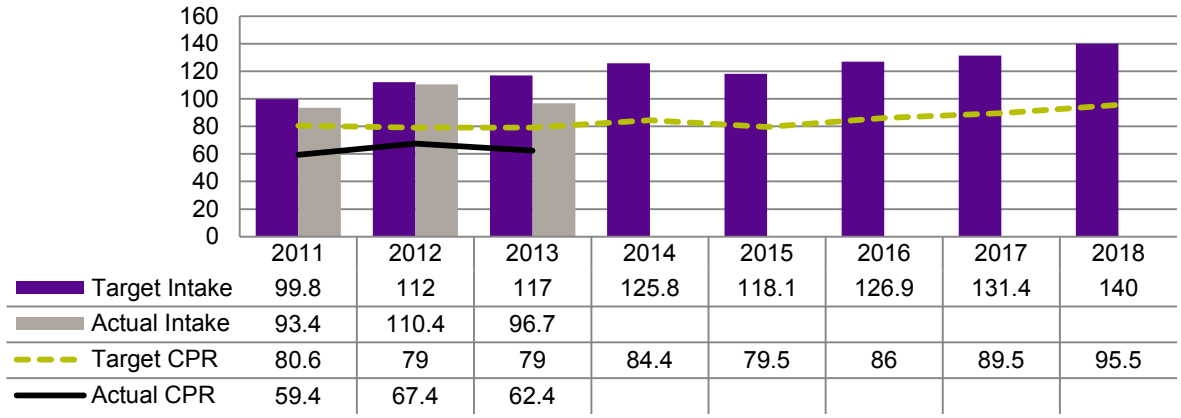
Undergraduate lab renewal

- Several major equipment purchases have been made, including: Two Fanuc M120i industrial robots to complement (and eventually replace) the two aging CRS robots; materials lab equipment; and fluids and heat transfer lab equipment.
- The pipe flow experimental equipment has been refurbished and updated by our technical staff.

C. GRADUATE STUDIES PLAN

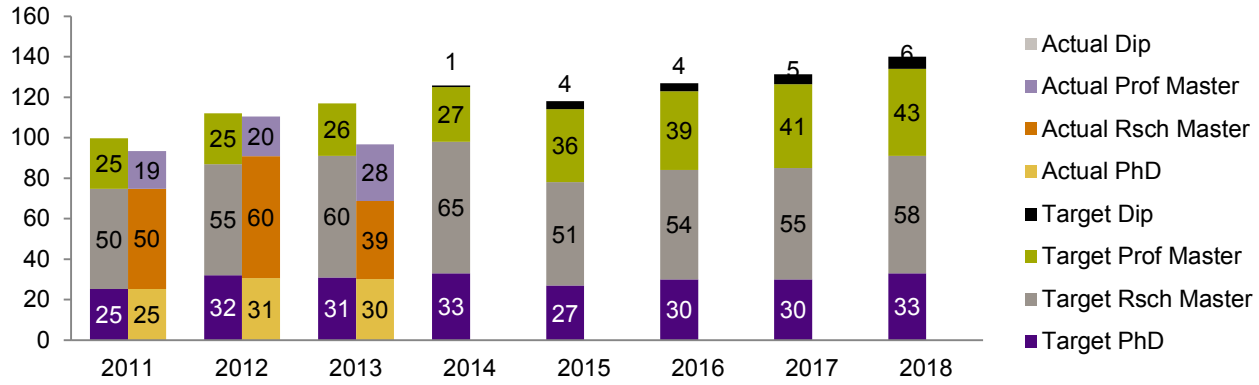
- As seen in Figure 65, we are behind our domestic targets. The need to increase the size of the domestic application pool is well documented, and both the Engineering Faculty and MME are working hard on this front. Until we succeed in attracting more domestic applicants, and/or providing some sort of incentive, we have revised our domestic and total intake targets for 2015-18.
- We are also behind our MASc target (Figure 66). We plan to start an open research seminar for our undergraduate students in their class professor hour to increase awareness of the research that our professors do, and the opportunities for graduate studies in the department.
- Launch of the online Green Energy Diploma received lower applicant response than anticipated.
- Preliminary data from MME graduate office records indicate we should meet or exceed 2014 targets.
- A major opportunity to address graduate space quality exists through a proposal for MME to be assigned additional space in EC4, as described in the Section III.I, Space.

Figure 65: MME Graduate Intake Plan Performance to Target by Visa Status



	2011	2012	2013	2014	2015	2016	2017	2018
Target Intake	99.8	112	117	125.8	118.1	126.9	131.4	140
Actual Intake	93.4	110.4	96.7					
Target CPR	80.6	79	79	84.4	79.5	86	89.5	95.5
Actual CPR	59.4	67.4	62.4					

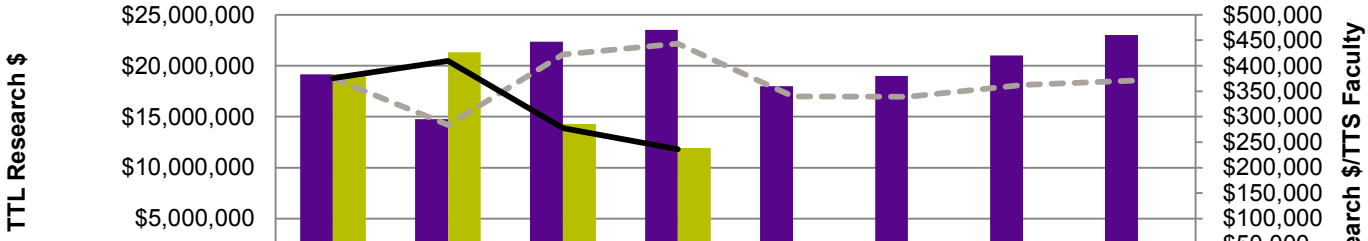
Figure 66: MME Graduate Intake Plan Performance to Target by Program Type



D. RESEARCH PLAN

- Research funding has continued to drop from last year. Two new CFI proposals submitted this summer will help reverse this trend, if successful.

Figure 67: MME Research Funding Plan Performance to Target



	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Target - Rsch $	$19,143,789	$14,765,131	$22,367,375	$23,500,000	$18,000,000	$19,000,000	$21,000,000	$23,000,000
Actual - Rsch $	$19,143,789	$21,302,262	$14,281,376	$11,932,489				
Target - Rsch $/TTS	$375,368	$283,945	$422,026	$443,396	$339,623	$339,286	$362,069	$370,968
Actual - Rsch $/TTS	$375,368	$409,659	$277,308	$236,287				

E. PHYSICAL SPACE PLAN

- No new space has been created, although we have lost some 300 NASM to the GAIA CFI initiative.
- Graduate office space and seating tracking software is in the process of being implemented.

Systems Design Engineering Department

Paul Fieguth, Chair

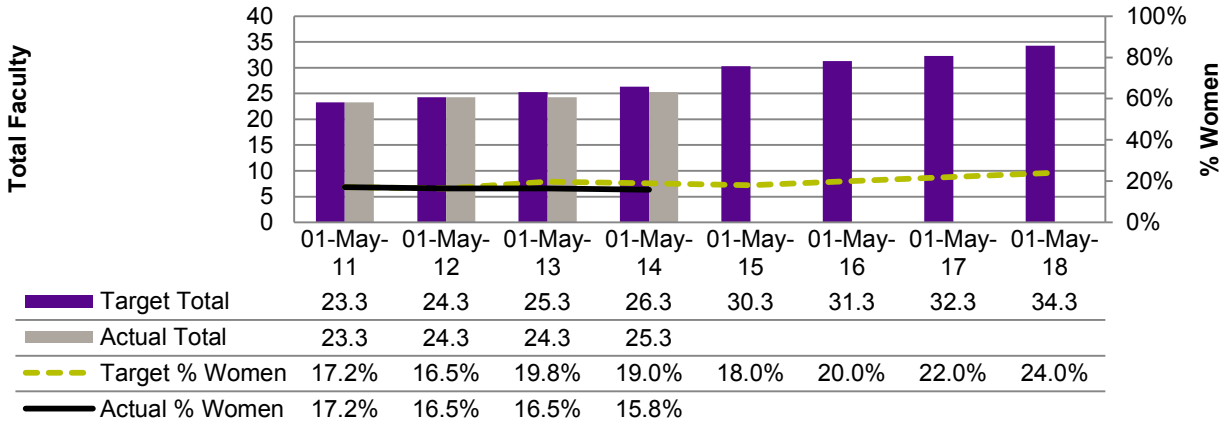
The academic year 2013/2014 was, unquestionably, most significantly marked by the formal approval and initiation of the Biomedical Engineering program. A variety of other Vision 2015 goals and strategies continued to be pursued; however, all goals were viewed through the lens of the new program.

A. FACULTY AND STAFF PLAN

We currently have six open positions: Two lecturers, two tenure-track faculty, and one administrative staff member, all for the Biomedical Engineering program, and one replacement administrative staff member resulting from a departure.

- In 2013/2014, three faculty hires were started or completed: Cameron Shelley, definite-term lecturer for the Centre for Society, Technology & Values; Shi Cao, tenure-track hire in the human factors area; and Andrea Scott, tenure-track hire in the socio-environmental area.
- In 2013/2014, four faculty positions were advertised and the hiring process initiated: Graduate Attributes Lecturer, related to the Engineering Ideas Clinic™ and outcomes-based assessment; a regular lecturer; and two tenure-track positions, both advertised broadly in the biomedical area, with research strengths sought in any of the three main biomedical thrusts: biodevices, biomechanics, and biosignals/bioimaging
- In 2013/14, one of the three hires was female. Looking ahead, we have had exceptionally qualified applicants for both the lecturer and the tenure-track positions, and expect at least one female hire there.

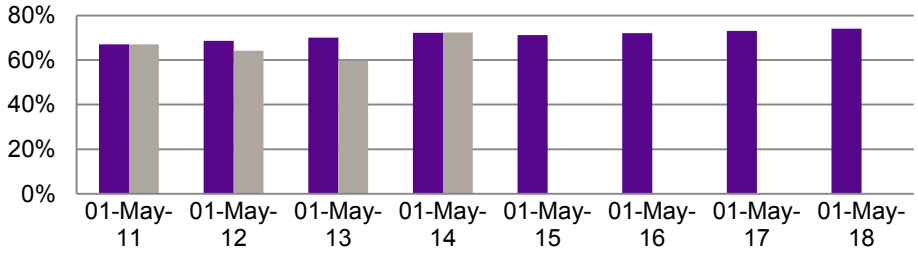
Figure 68: SDE Regular Faculty Complement Plan Performance to Target



	01-May-11	01-May-12	01-May-13	01-May-14	01-May-15	01-May-16	01-May-17	01-May-18
Target Total	23.3	24.3	25.3	26.3	30.3	31.3	32.3	34.3
Actual Total	23.3	24.3	24.3	25.3				
Target % Women	17.2%	16.5%	19.8%	19.0%	18.0%	20.0%	22.0%	24.0%
Actual % Women	17.2%	16.5%	16.5%	15.8%				

- The PEng target has been met, and PEng eligibility has become a priority in hiring considerations.

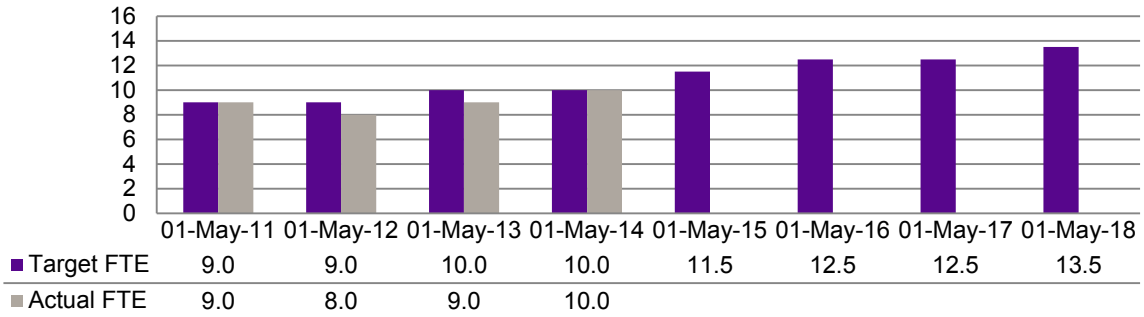
Figure 69: SDE Regular Faculty PEng Status Performance to Target



	01-May-11	01-May-12	01-May-13	01-May-14	01-May-15	01-May-16	01-May-17	01-May-18
Target % Registered&Applied	67.1%	68.6%	70.0%	72.2%	71.2%	72.0%	73.0%	74.0%
Actual % Registered&Applied	67.1%	64.2%	59.7%	72.3%				

- One staff position was filled in 2013/14: We were very pleased that Angie Muir, who had previously worked on contract in Systems Design Engineering, joined the department to replace a staff departure.

Figure 70: SDE Staff Complement Plan Performance to Target



Faculty mentoring and career development

- The mentoring of pre-tenure faculty has successfully become standard practice within Systems Design.
  - Fraction of pre-tenure faculty who have twice-yearly mentoring with the department chair: 100%
  - Fraction of untenured faculty having a documented career plan: about 75%
  - Fraction of untenured faculty having a documented service plan: about 50%

Faculty and teaching assignments

- The current Undergraduate Chair has made significant progress in updating teaching competence within the department. Since biomedical hiring will take place over approximately eight years, with the teaching tasks associated with the new program expanding over approximately five years, the process of examining teaching tasks will continue to be a priority for five to six years.

Staff restructuring

- The organization of Systems Design staff is relatively solid. With additional staff hiring projected in each of the next four years, the reorganization of staff will need to be an ongoing process.
- The current structure has one person combining administrative and finance leadership; once biomedical hiring has completed, for reasons of workload this position will need to be divided.

B. UNDERGRADUATE STUDIES PLAN

- All existing programs in which we participate – Systems Design, Mechatronics, and Biomedical – are on target. There are no changes to the indicated targets.
- The number of international visa students in Systems Design continues to lag target. This is almost certainly because Systems programs are, both at Waterloo and elsewhere, in general not as well understood, at least at the high school level, as traditional fields.

Figure 71: SDE Undergraduate Intake Plan Performance to Target

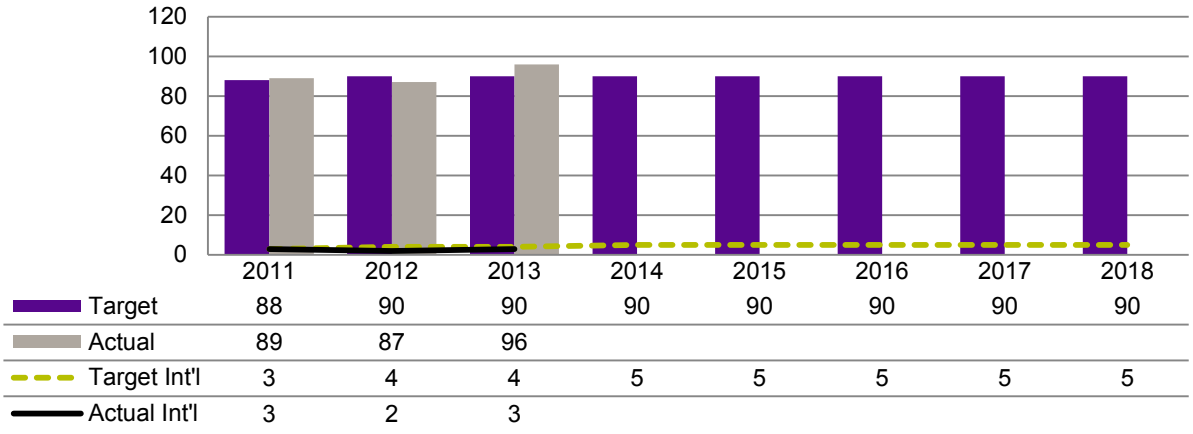


Figure 72: MCTR Undergraduate Intake Plan Performance to Target

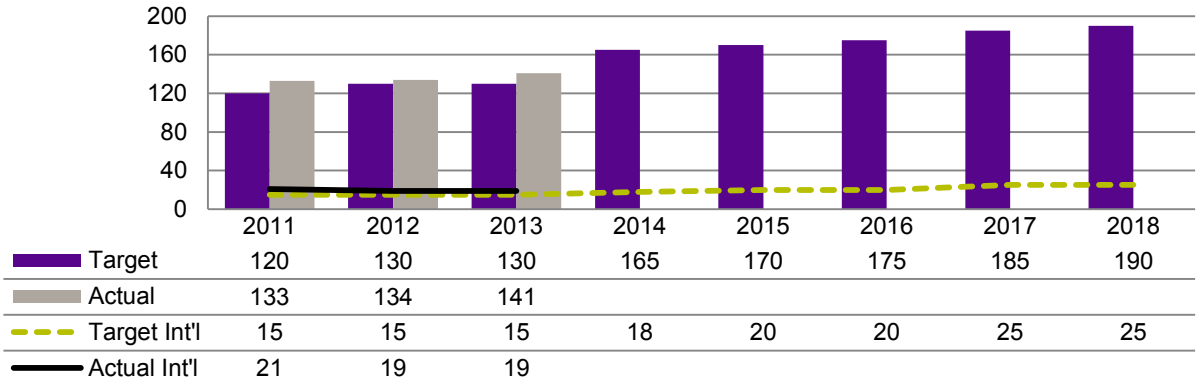
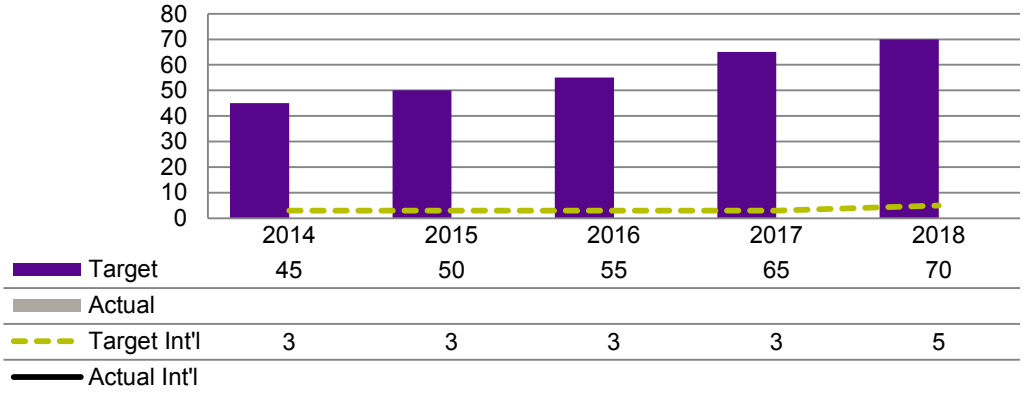


Figure 73: BIO Undergraduate Intake Plan Performance to Target



Teaching quality

- Glenn Heppler works as our department representative with the Associate Dean, Teaching and his committee. The Chair and the Undergraduate Chair have been proactive in connecting teaching faculty with Professor Heppler and with the Centre for Teaching Excellence workshops.
- A significant step this year was having two faculty at the University's teaching academy.

Laboratory program

- The undergraduate teaching laboratory sequence has seen significant improvements. A completely revised course, lab, and lab components were successfully introduced in spring 2013. The 1B class in SYDE 192/192L had a great experience, with very positive reviews of the lab, particularly the lab project. The revised lab stream, projects, and kit has been completed for 192L. Work continues on SYDE 292L and 352L.

Fractional-load first-year program

- This objective has stalled, partly because of our focus on the Biomedical Engineering program, and partly because of incompatibilities between the views of the department and the Engineering First Year Office on this topic.

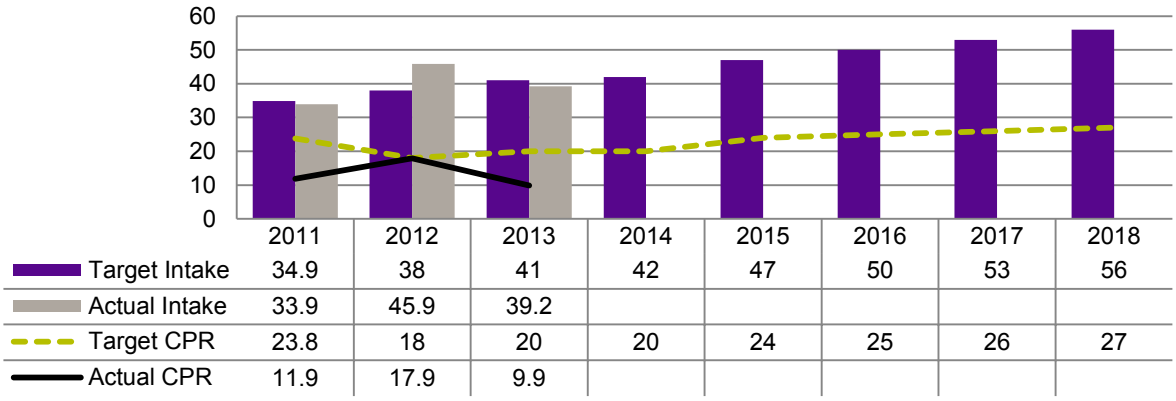
Non-technical curriculum components

- This item has been identified as high priority. The technical staff and the Undergraduate Chair are working toward developing a program of basic skills.

C. GRADUATE STUDIES PLAN

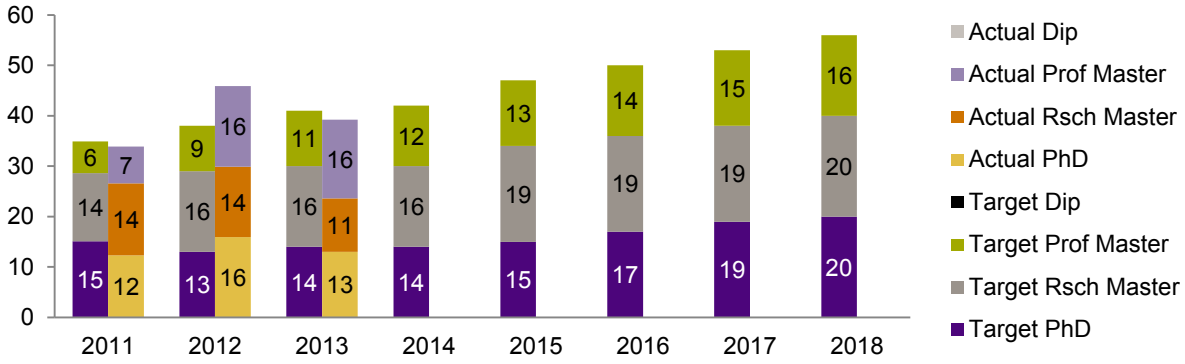
- Graduate admissions were, in total, close to target; however, the CPR numbers were disappointing. CPR MEng applicants had been strong in recent years, so more attention will need to be placed here.
- Graduate intake numbers fluctuate significantly from year to year, so it is difficult to comment on performance to target for a relatively small department like Systems Design. One ongoing challenge is that applicants need to pay for each department applied to, which creates a systematic bias against smaller departments.

Figure 74: SDE Graduate Intake Plan Performance to Target by Visa Status



	2011	2012	2013	2014	2015	2016	2017	2018
Target Intake	34.9	38	41	42	47	50	53	56
Actual Intake	33.9	45.9	39.2					
Target CPR	23.8	18	20	20	24	25	26	27
Actual CPR	11.9	17.9	9.9					

Figure 75: SDE Graduate Intake Plan Performance to Target by Program Type

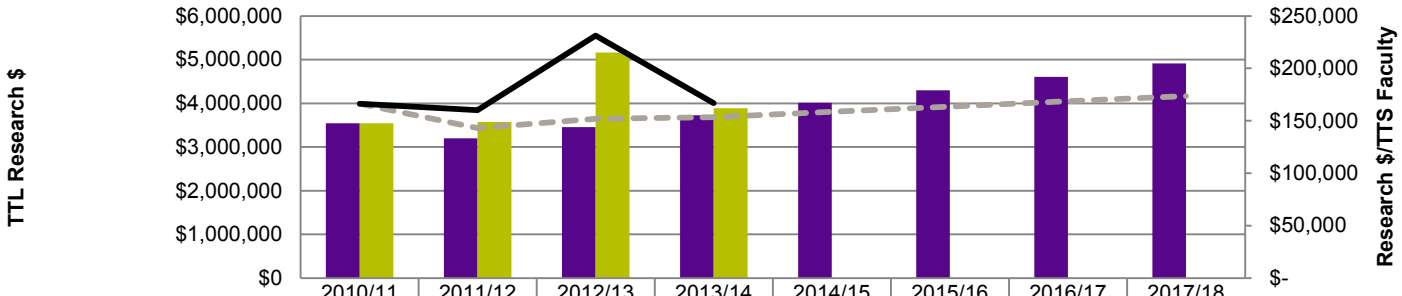


D. RESEARCH PLAN

Overall, Systems Design has had strong research performance, and there are quite a number of highly active faculty pursuing quite visible research agenda.

- With most of the biomedical hires at the junior level, we expect only a relatively slow increase in research funding per tenured/tenure-stream faculty initially, until more of the new faculty become established.
- The large spike shown in Figure 76 in 2012/13 is associated with a large CFI grant, which are relatively rare.

Figure 76: SDE Research Funding Plan Performance to Target



	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Target - Rsch $	$3,544,148	$3,195,000	$3,456,500	$3,728,000	$4,009,500	$4,301,000	$4,602,500	$4,914,000
Actual - Rsch $	$3,544,148	$3,571,359	$5,165,527	$3,884,899				
Target - Rsch $/TTS	$166,392	$143,000	$152,000	$153,416	$158,478	$163,536	$168,590	$173,640
Actual - Rsch $/TTS	$166,392	$160,151	$231,327	$166,734				

Research directions

- This goal is in progress, but requires more work. The Chair has raised the topic and is working to get a number of faculty engaged on longer-term thinking regarding the department and direction, a question associated with the large number of hires made possible by the Biomedical Engineering program.

E. BIOMEDICAL ENGINEERING PLAN

The Biomedical Engineering program was approved in December, 2013. Although it launched very last-minute in the applications process, and with no advertising, the program attracted over 500 applicants, over 50% female. A great deal of work remains to be done; however, we are exceptionally pleased with how we have progressed and consider the presence of this program to be a stunning accomplishment of the Vision 2015 plan.

Biomedical Engineering undergraduate program

- The program was approved in December, 2013 and the first cohort began studies in September, 2014.
- Response from high school students was exceptionally strong, and we would expect that with the promotion and advertising over the past year, the response will be that much stronger in 2014/15.
- The next urgency for this program is to identify space for teaching, and research space for new hires. Significant progress has been made in formulating the Engineering 7 floor layout and we are hopeful for the possibility of moving a group into EC4, as described in Section III.I, Space.

Biomedical Engineering graduate program

- Much of the department's energy and priorities focus on the undergraduate Biomedical Engineering program, and the graduate program is not a priority for the time being. As additional faculty are hired, with related research and graduate student goals, the need to consider a graduate program will increase.

F. DESIGN PLAN

Design is central to the Systems Design Engineering program, and is also a passion of the current Department Chair and Undergraduate Chair. Nevertheless, the workload associated with the Biomedical Engineering program has made progress on the design sequence challenging. This remains a very high priority; however, there is only modest progress to report.

Design sequence

- 2013/14 saw a much tighter integration between graphics (101L) and design (161), a development which we believe to be very positive, and re-enforcing prototyping in design and 3D printing.
- We have made progress in more clearly developing and defining objectives for second-year design courses.

Design symposia

- The symposia have run well in the past few years, but have lacked energy and have become stale. The department needs to put more creative energy into the symposium, creating high expectations of quality among students, and a greater degree of involvement among faculty. This is a project planned for 2014/15.

Design support

- Design support was successfully developed in 2013/14 for a dynamics design project in spring 2014.
- Significant planning has taken place for space renovation with respect to design, with progress expected in 2014/15.

G. ADVANCEMENT PLAN

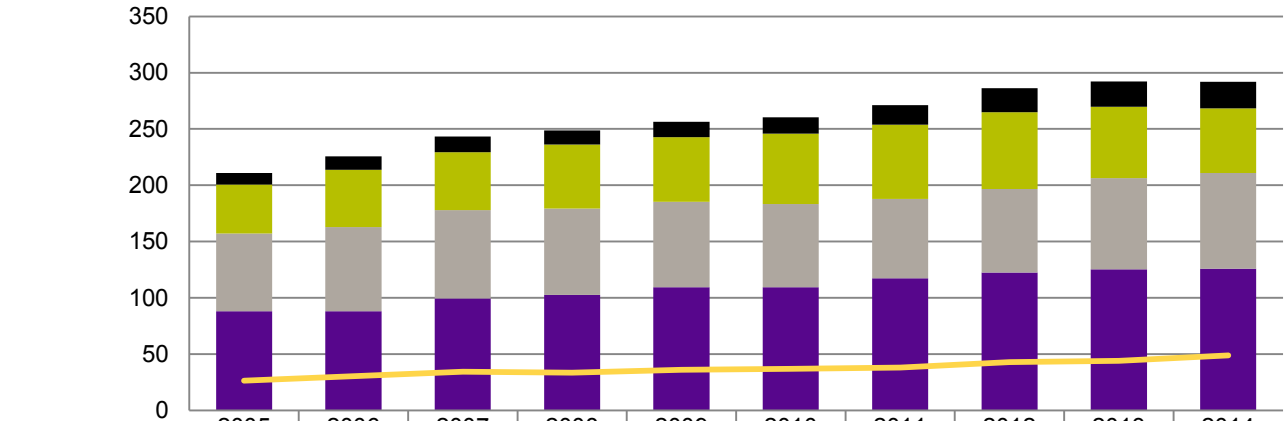
- There have been only very limited advancement related activities in the department; however, the Department Chair has worked to support advancement in alumni events and alumni visits in Toronto, Boston and Ottawa.

IV. Key Metrics & Performance Indicators

The information presented in this section focuses on overview data at the Faculty level. For more detailed information and for data at the department or program level, please refer to the tabular data presented in Appendices A-H. For data definitions and sources, please refer to the alpha-numeric code in parentheses at the end of each figure title and the corresponding entry in Appendix I.

A. Faculty and Staff

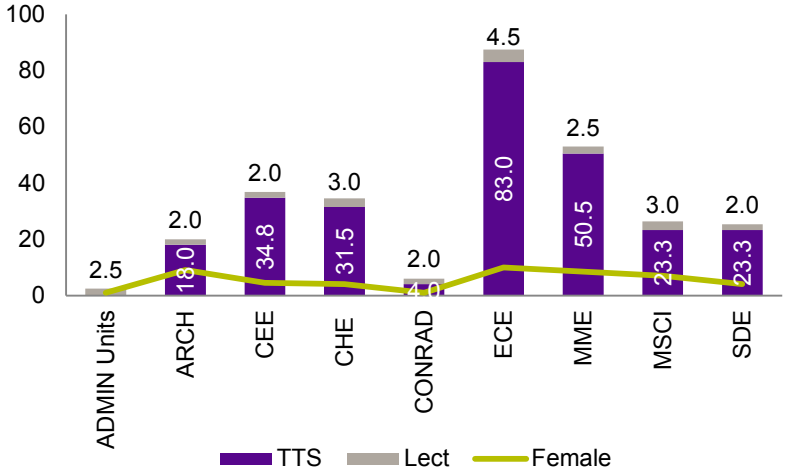
Figure 77: Regular Faculty 2005-2014 (A1)



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Lect	10.0	12.0	14.0	12.5	13.5	14.5	17.5	21.5	22.5	23.5
Asst Prof	43.5	51.0	51.3	57.0	57.5	62.5	66.0	68.0	63.5	57.5
Assoc Prof	69.3	74.8	78.5	76.8	75.8	73.8	70.3	74.3	81.0	85.0
Prof	88.0	88.0	99.5	102.5	109.5	109.5	117.5	122.5	125.3	125.9
Female	26.5	30.5	34.5	33.5	36.0	37.0	38.0	43.0	44.0	49.0

Over the past decade, the regular faculty complement in Waterloo Engineering has grown by 81 (38.5%), and the number of women faculty has increased by 22.5 (85%). This includes the addition of the Conrad Business, Entrepreneurship and Technology Centre (which had two regular faculty members when it joined Engineering in 2006).

Figure 78: Regular Faculty, 2014 (A1)



As of May 1, 2014 Waterloo Engineering's regular faculty complement was 291.9, comprised of 268.4 tenured/tenure-stream faculty and 23.5 lecturers (definite-term and continuing).

The proportion of faculty who are women ranged among departments from 11.4% to 45%, with a Faculty-wide average of 16.8%.

Figure 79: TTS Faculty by PhD School, 2014 (A4)

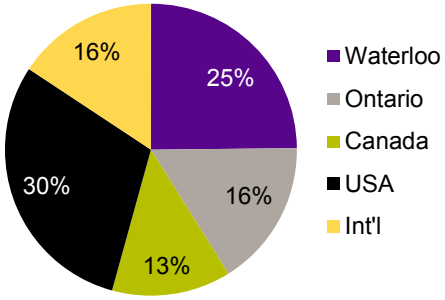
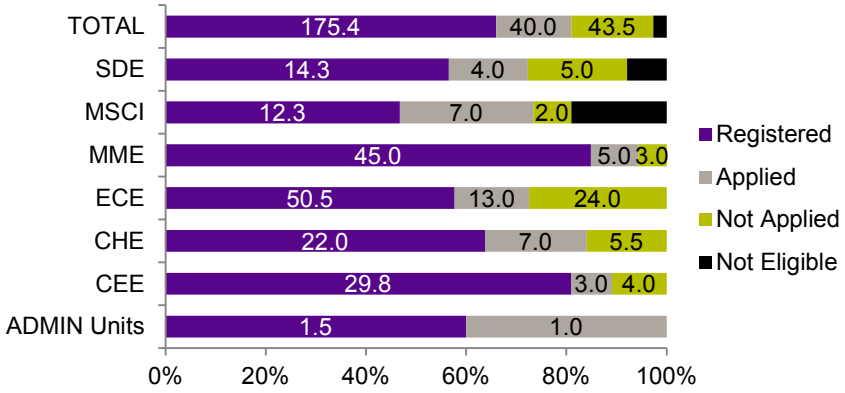


Figure 80: Regular Faculty by PEng Status, 2014 (A2)



Our complement includes faculty members who have earned PhDs from a wide range of schools (see Figure 79). Over time, the proportion of faculty who have earned degrees from Waterloo has declined, as a broader and more global representation of PhD schools has developed.

As shown in Figure 80, 80% of faculty in engineering disciplines are registered or have applied for the PEng (including some limited licences). This ranges from 72% to 91% among departments.

While 29% of our faculty members are 55 years old or older, this is balanced by a significant share (22%) under the age of 40. We must remain attentive to the significant group (48%) aged 40-55 in our future planning (see Figure 81).

Figure 81: Age Distribution of Regular Faculty, 2014 (A3)

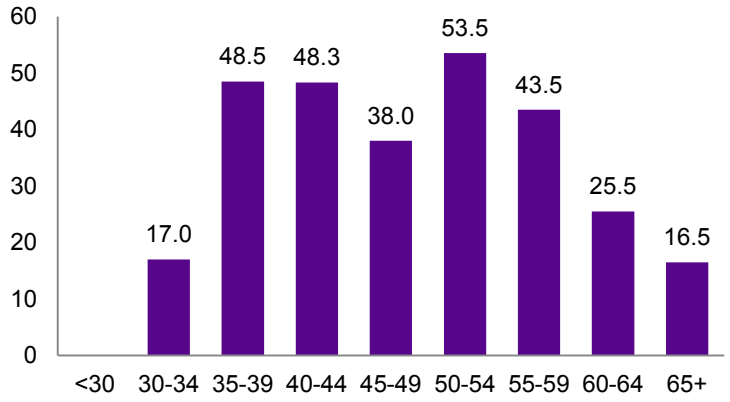


Figure 82: Non-regular and Non-faculty Appointments by Department, 2014 (A5)

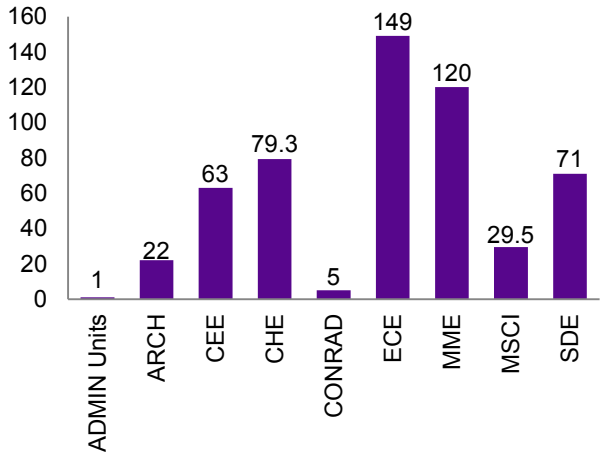
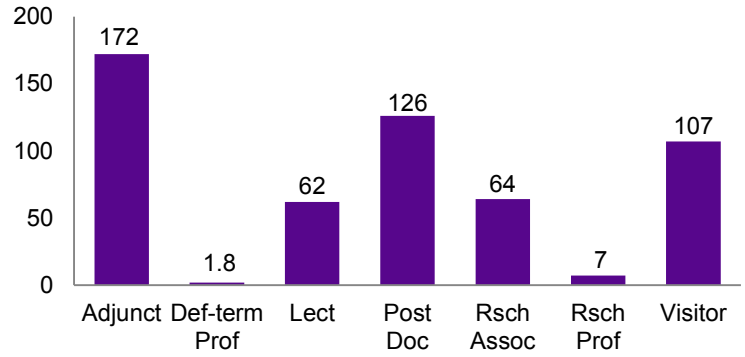
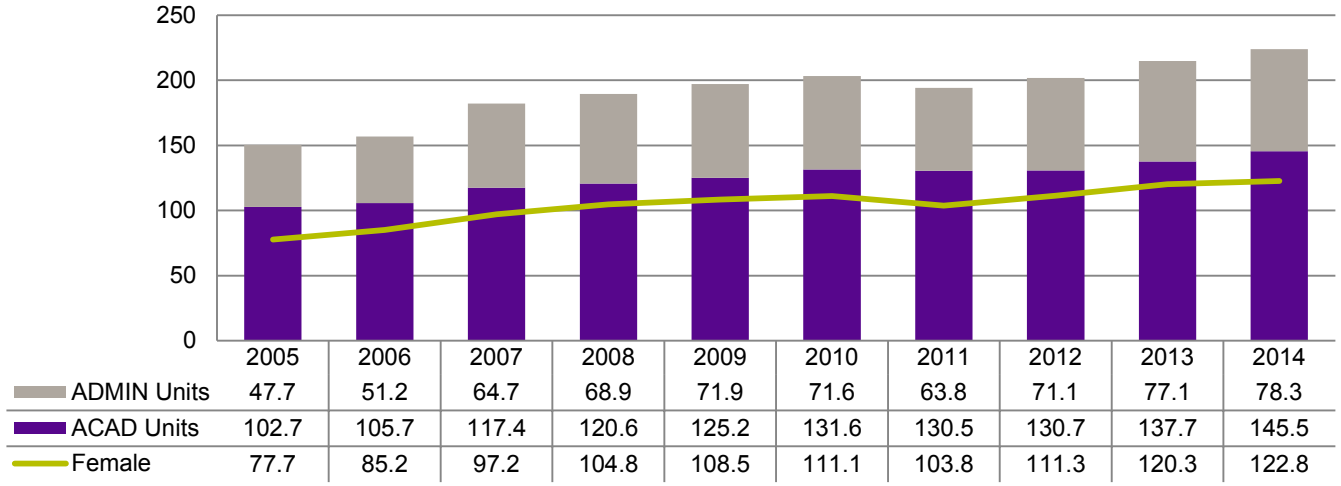


Figure 83: Non-regular and Non-faculty Appointments by Type, 2014 (A5)



In addition to our regular faculty complement, the contributions of a wide range of non-regular faculty members (as shown in Figure 82 and Figure 83) enrich our academic and research environment.

Figure 84: FTE Staff, 2005-2014 (A7)



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
ADMIN Units	47.7	51.2	64.7	68.9	71.9	71.6	63.8	71.1	77.1	78.3
ACAD Units	102.7	105.7	117.4	120.6	125.2	131.6	130.5	130.7	137.7	145.5
Female	77.7	85.2	97.2	104.8	108.5	111.1	103.8	111.3	120.3	122.8

The staff complement in Waterloo Engineering grew by 73 (49%) over the past decade. This includes two staff members who joined Engineering with the Conrad Centre when it became part of the Faculty of Engineering in 2006.

As of May 1, 2014 there were 223.8 regular FTE staff members in Engineering: 145.5 FTE (79 technical staff and 66.5 administrative staff) in our academic units and 78.3 (58.3 administrative and 20.0 technical) in our administrative units. The current distribution of staff is shown in Figure 85 and Figure 86.

Figure 85: FTE Staff in Academic Units, 2014 (A7)

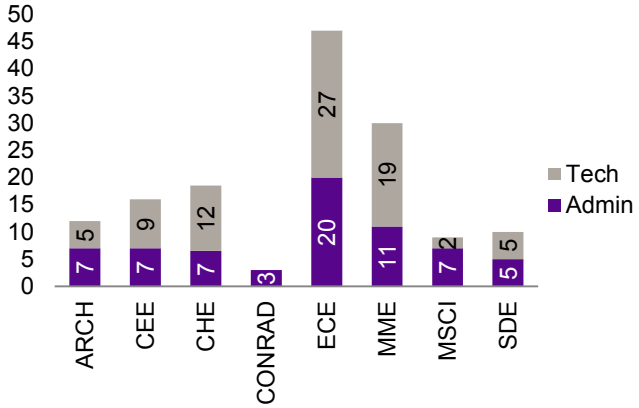


Figure 86: FTE Staff in Administrative Units, 2014 (A7)

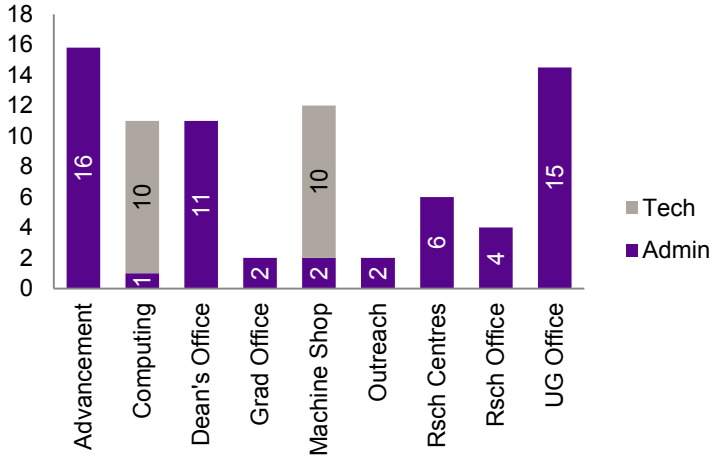
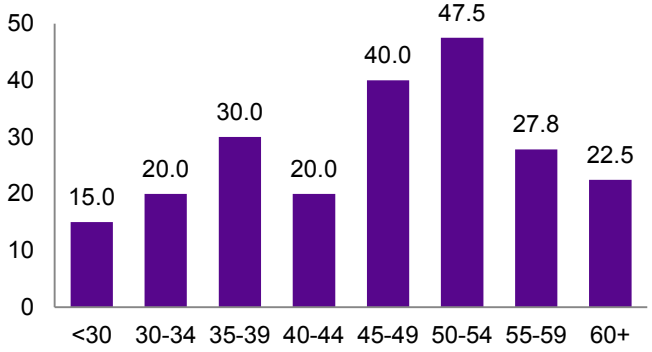
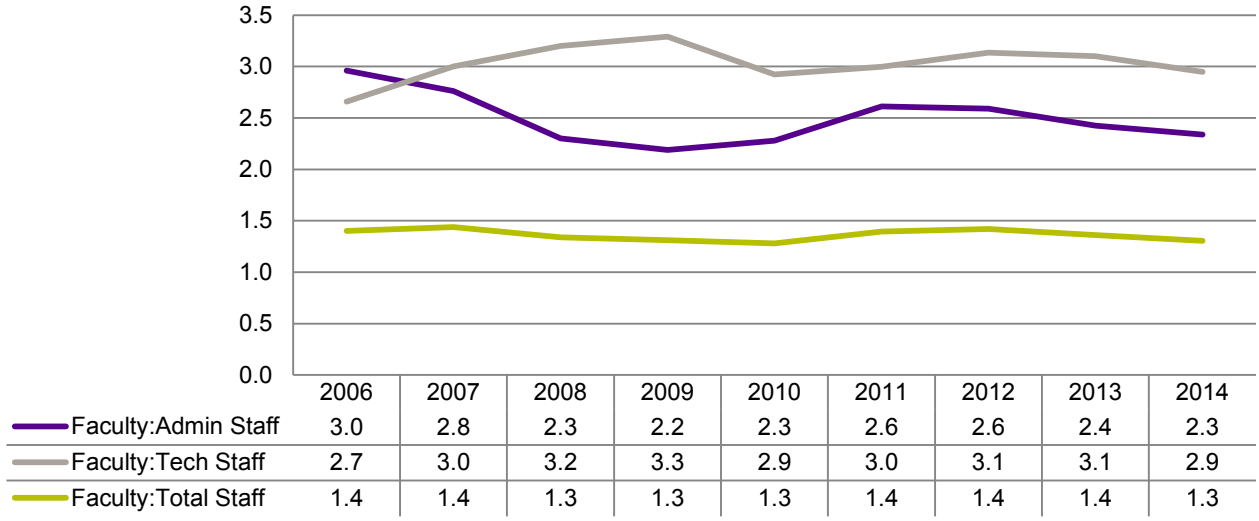


Figure 87: Age Distribution of Staff, 2014 (A8)



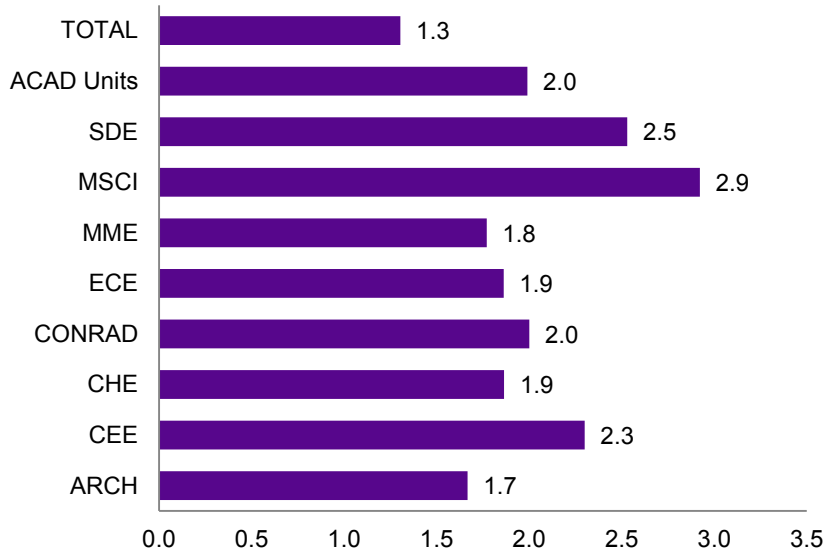
The current age distribution of our staff complement points to a need to plan for increasing staff renewal in the coming years: 22.5% of our staff complement is 55 years of age and older, and an additional 39% is aged 45 to 55 years old.

Figure 88: Faculty to Staff Ratios, 2006-2014 (A10)



	2006	2007	2008	2009	2010	2011	2012	2013	2014
Faculty:Admin Staff	3.0	2.8	2.3	2.2	2.3	2.6	2.6	2.4	2.3
Faculty:Tech Staff	2.7	3.0	3.2	3.3	2.9	3.0	3.1	3.1	2.9
Faculty:Total Staff	1.4	1.4	1.3	1.3	1.3	1.4	1.4	1.4	1.3

Figure 89: Faculty to Staff Ratios, 2014 (A10)

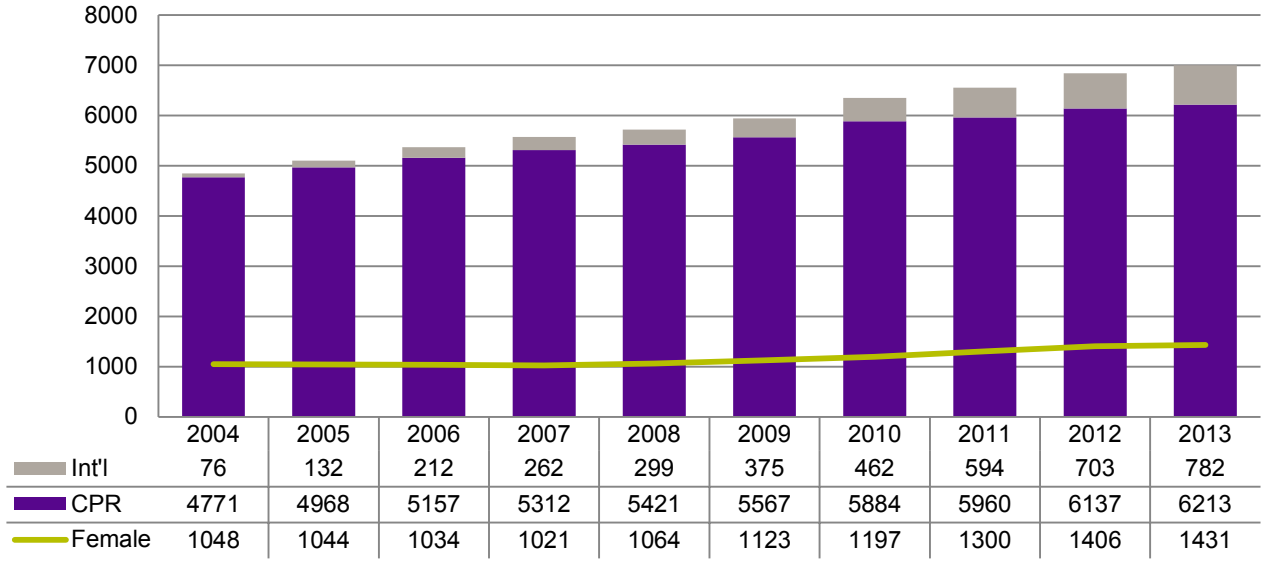


The average ratio of regular faculty members to FTE staff members for the Faculty as a whole (including staff in administrative units, which do not typically have a faculty complement) has remained stable over the past nine years. However, as shown in Figure 88, the distribution of this figure as applied to administrative staff and technical staff has varied over the same time period.

As of May 1, 2014, the ratio of regular faculty to all FTE staff was 1.3 for the Faculty as a whole and 2.0 in academic units only (i.e. excluding staff in administrative support offices) Figure 89 shows the distribution of this ratio across academic units, which varies among disciplines due to their varying technical intensity.

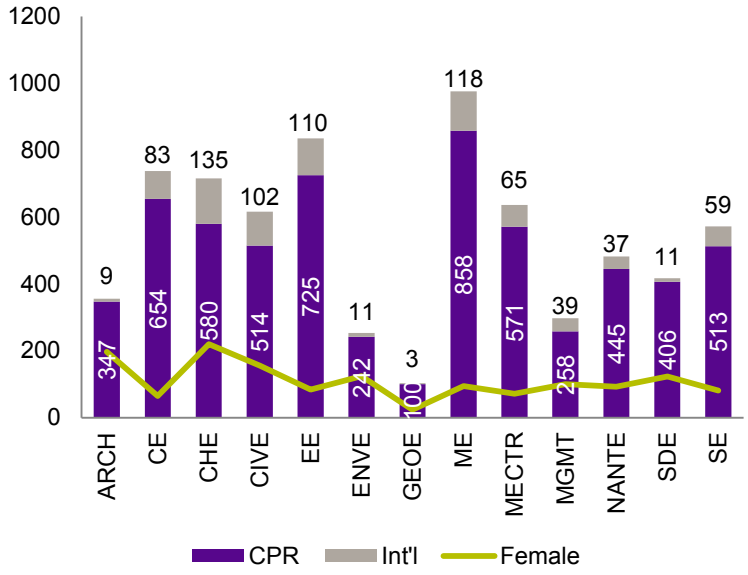
B. Undergraduate Studies

Figure 90: Undergraduate Enrolment 2004-2013 (B1)



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Int'l	76	132	212	262	299	375	462	594	703	782
CPR	4771	4968	5157	5312	5421	5567	5884	5960	6137	6213
Female	1048	1044	1034	1021	1064	1123	1197	1300	1406	1431

Figure 91: Undergraduate Enrolment, Fall 2013 (B1)



Over the past decade, our undergraduate enrolment (head count) has increased by over 44%, or 2,148, to a record total of 6,995 students as of November 1, 2013. Over the same time frame, international student enrolment grew by 706 and the enrolment of female students increased by 383.

Figure 91 shows the distribution of the fall 2013 undergraduate enrolment in the Faculty of Engineering by program.

Figure 92: Undergraduate Students per Regular Faculty Member, 2005/06-2013/14 (B6)

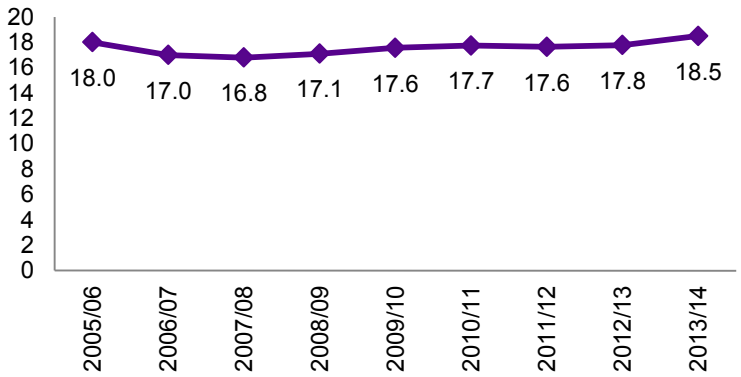
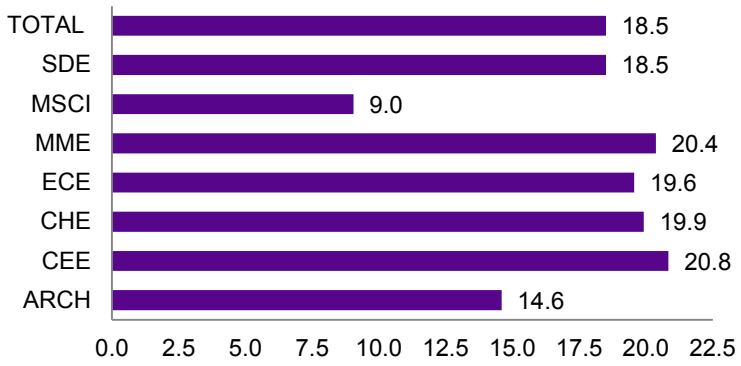


Figure 93: Undergraduate Students per Regular Faculty Member, 2013/14 (B6)



Widely recognized as one indicator of undergraduate program quality, the ratio of undergraduate students to regular faculty members is a metric we monitor annually. Figure 92 shows a gradual increase in this number since a low point in 2007/08, rising to 18.5 in 2013/14. Despite strategic increases to the faculty complement in recent years, this ratio has risen due to commensurate undergraduate enrolment increases across programs. The figure for 2013/14 is likely marginally inflated by a relatively high number of vacant faculty positions on the date at which the faculty count for this ratio is measured (May 1, 2014).

For 2013/14, this ratio at the Faculty level is 18.5. The distribution of this ratio by department is shown in Figure 93. Management Sciences is anomalous here because it was home to a large established graduate program and undergraduate option before launching the undergraduate management engineering program in 2007.

Figure 94: Undergraduate Year One New Admissions, 2007-2013 (B4)

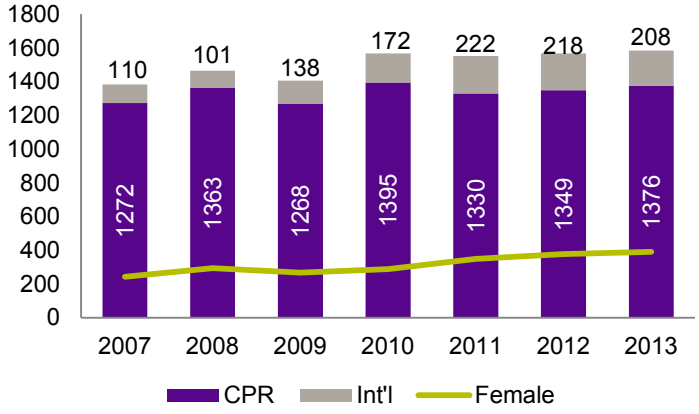
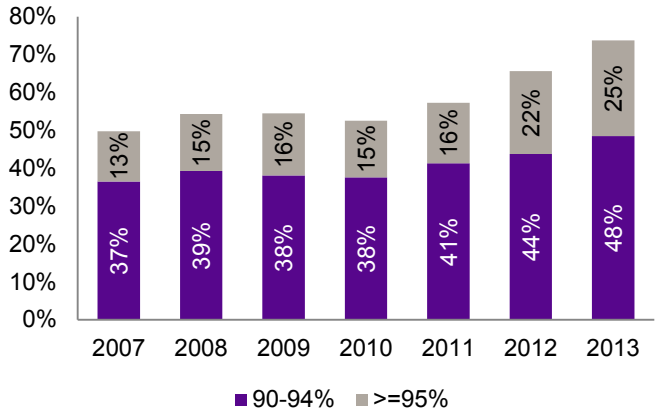


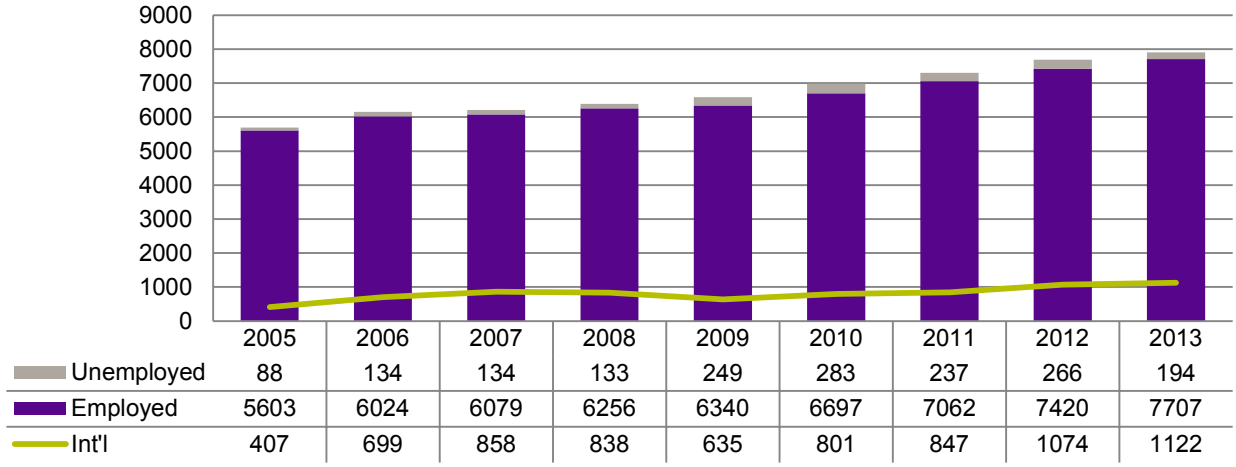
Figure 95: Undergraduate Admissions by Final Entering Grade Averages, 2007-2013 (B5)



Over the past seven years, first-year intake into the Faculty of Engineering has increased by just over 200 students or 15%. Over the same time period, international admissions have increased by 89% and the number of female students in the first-year class has increased by 61%.

Figure 95 depicts a steady increase over the past seven years in the proportion of undergraduate students entering Waterloo Engineering with incoming final high school averages over 95% and between 90-94%. The record high in 2013 indicates that 73% of entering students had a final high school average of 90% or higher, an affirmation of the exceptionally high quality students we attract to our renowned undergraduate program.

Figure 96: Co-op Employment, 2005-2013 (B8)



	2005	2006	2007	2008	2009	2010	2011	2012	2013
Unemployed	88	134	134	133	249	283	237	266	194
Employed	5603	6024	6079	6256	6340	6697	7062	7420	7707
Int'l	407	699	858	838	635	801	847	1074	1122

As our undergraduate student enrolment increases, so does the number of work terms required to fulfill our commitment to co-operative education for all undergraduates. In 2013, the number of required work terms reached an all-time high of 7,901; this is an increase of over 2,200 work terms (or 38%) over the number required nine years ago (see Figure 96). Despite this substantial increase, we maintain excellent employment rates. In 2013, the overall employment rate was 97.5%, consistent with performance that has ranged from 95.9% to 98.5% since 2005. Employment rates for 2013 range by program from 90% to 99% (see Figure 97).

Figure 97: Co-op Employment by Program, 2013 (B8)

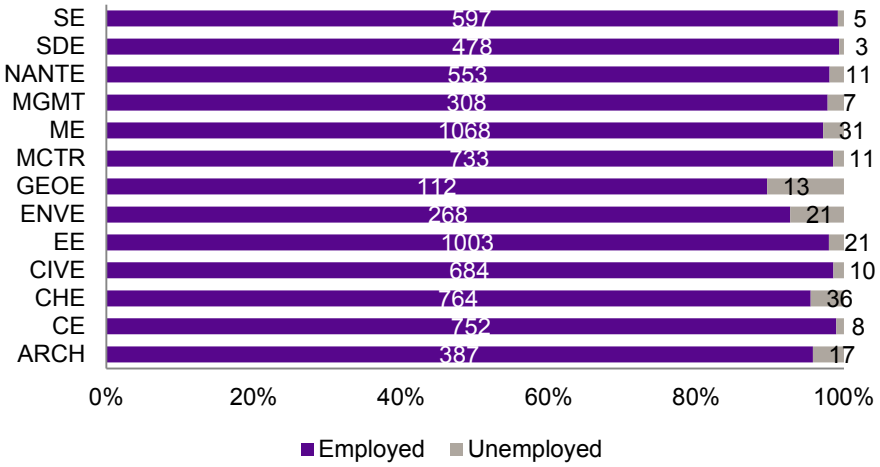


Figure 98: Co-op Employment by Location, 2013 (B8)

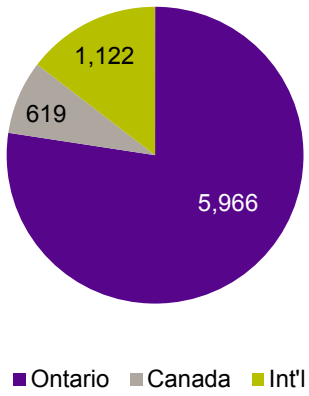
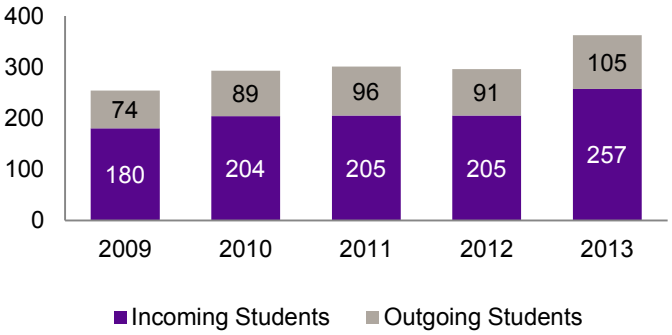


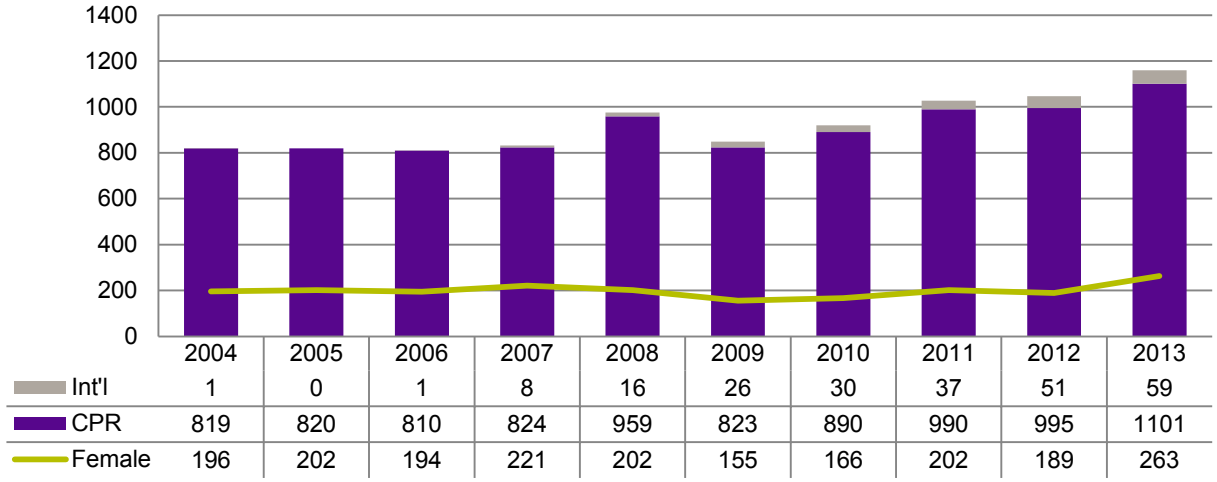
Figure 99: Undergraduate Student International Exchange Participation, 2009-2013 (B10)



Work terms afford engineering undergraduate students at Waterloo the unique opportunity to explore multiple work settings over the course of their studies, including global experiences. As shown in Figure 96 and Figure 98, over the past nine years the number of work terms completed outside of Canada has increased by 175%, reaching a record total of 1,122 in 2013.

In addition to international work terms, another valuable global experience available to Waterloo Engineering undergraduates is international exchange, participation in which has also increased in recent years (see Figure 99).

Figure 100: Undergraduate Degrees Granted, 2004-2013 (B3)



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Int'l	1	0	1	8	16	26	30	37	51	59
CPR	819	820	810	824	959	823	890	990	995	1101
Female	196	202	194	221	202	155	166	202	189	263

Over the past 10 years, degrees awarded annually to Waterloo Engineering undergraduate students increased by 41%. We reached an all-time high number of degrees granted in 2013, awarding 1,160 undergraduate degrees.

Figure 101 shows the distribution of undergraduate degrees granted in 2013 by program and Figure 103 provides a normalized indicator of degrees granted per regular faculty member. Management Sciences is anomalous here because it was home to a large established graduate program and undergraduate option before launching the undergraduate management engineering program in 2007.

To better understand the extent to which the increase in degrees awarded over time is related to increasing faculty complement, Figure 102 shows an increase in the number of degrees granted per regular faculty member over the past five years.

Figure 101: Undergraduate Degrees Granted, 2013 (B3)

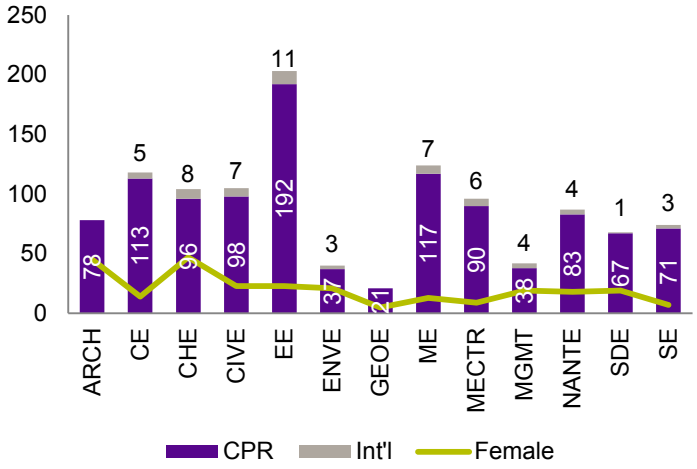


Figure 102: Undergraduate Degrees Granted per Regular Faculty Member, 2009/10-2013/14 (B7)

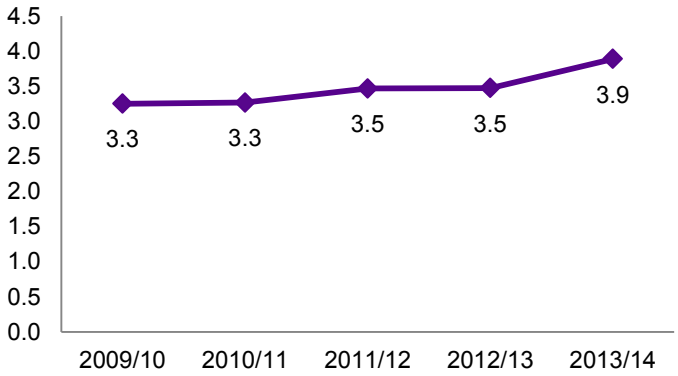
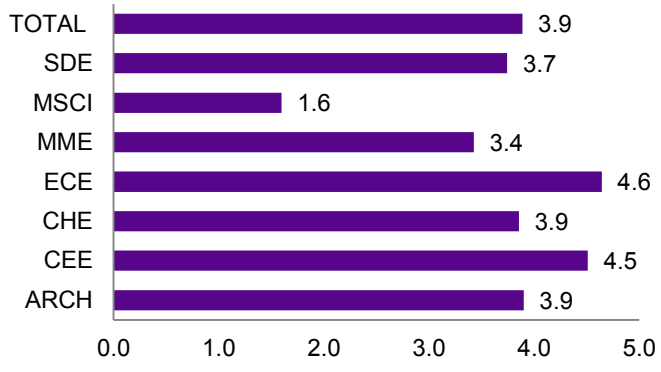
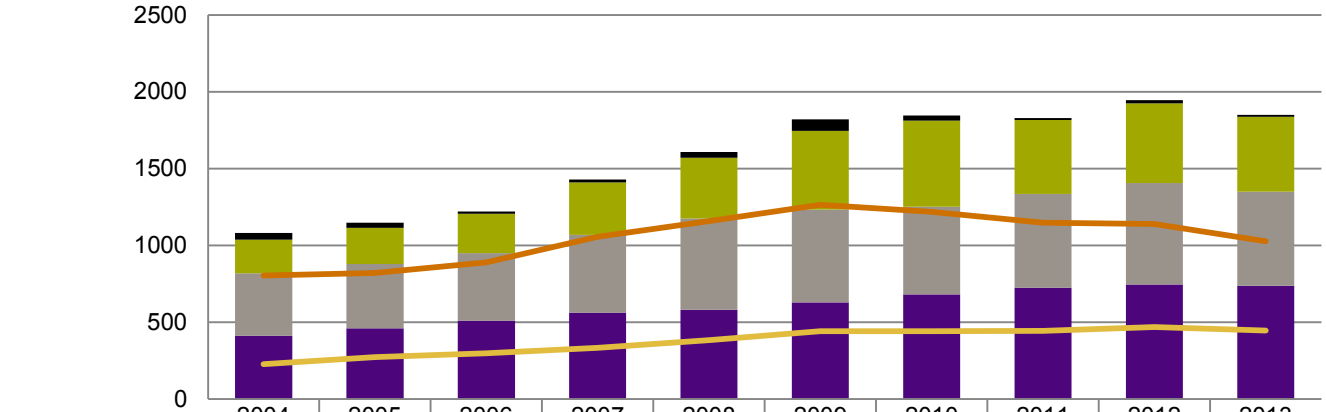


Figure 103: Undergraduate Degrees Granted per Regular Faculty Member, 2013/14 (B7)



C. Graduate Studies

Figure 104: Graduate Enrolment, 2004-2013 (C1)



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Non-Deg	43	32	16	18	37	75	32	12	21	12
Prof Master	219	237	255	343	396	513	562	483	520	488
Rsch Master	405	418	440	506	594	604	570	609	660	612
PhD	413	460	510	562	580	629	681	725	745	738
Female	226	272	298	333	383	442	441	444	469	445
CPR	803	821	889	1056	1159	1264	1218	1147	1139	1026

Over the past 10 years, our graduate enrolment (head count) has increased by over 51% or 770 students to 1,850 on November 1, 2013. Over that period, PhD enrolment increased by 79% and the number of female students enrolled increased by 97%. The number of students who are Canadian or permanent residents increased by 28%, growing at a rate significantly slower than the overall enrolment rate (reflecting the increasing proportion of our graduate student body that is comprised of international students).

Figure 105: Graduate Enrolment, 2013 (C1)

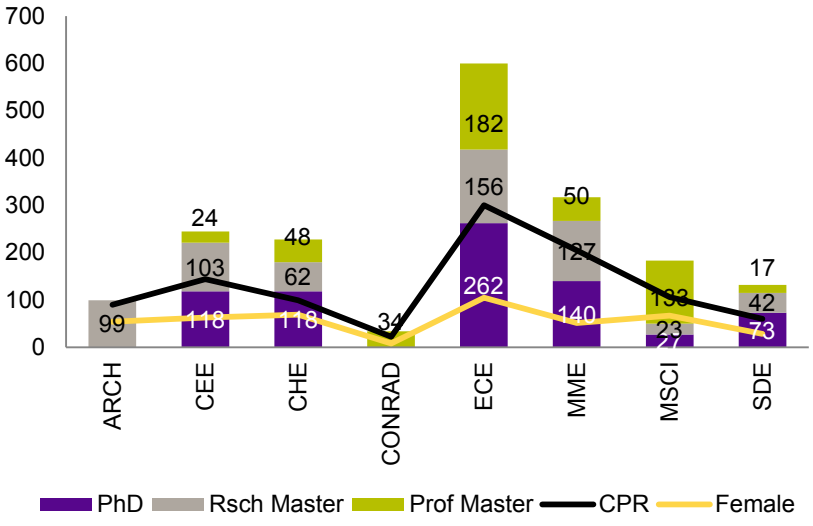


Figure 105 shows the distribution of fall 2013 graduate enrolment by department, visa status and gender. Figure 107 normalizes that data to tenured-tenure/stream faculty. In Figure 106, which shows the trend over the past nine years in graduate student to faculty ratios, it can be seen that the ratio of research students to faculty members has been relatively stable over the past six years. The addition of professional master's students to this ratio results in more variability.

Figure 106: Graduate Students per TTS Faculty Member, 2005/06-2013/14 (C5)

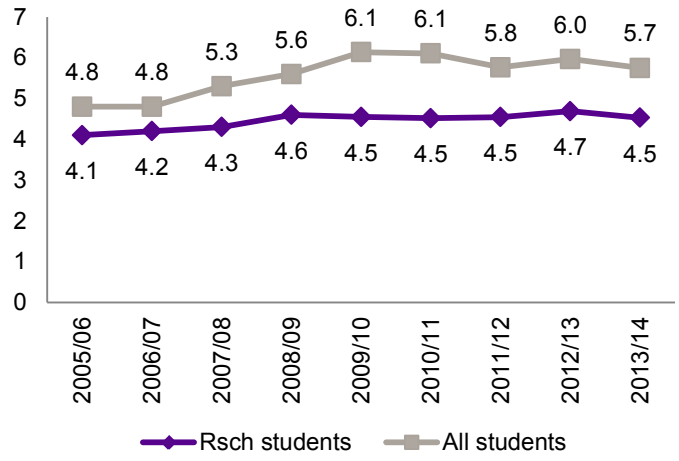
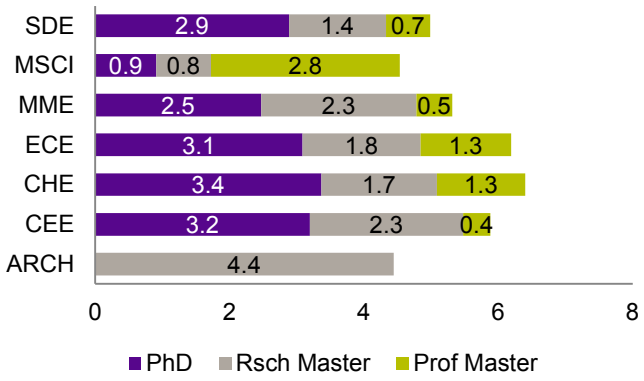


Figure 107: Graduate Students per TTS Faculty Member, 2013/14 (C5)



**graph excludes Conrad, which had 9.4 professional master's students per TTS faculty in 2013/14.*

While graduate enrolments have been increasing over the past decade, so too have undergraduate enrolments. We track the proportion of the overall FTE student enrolment that is comprised of graduate students as a means to better understand graduate growth in the context of overall Faculty activity. Figure 108 shows this proportion over the past five years. In 2013/14, the graduate proportion of total FTE student enrolment ranged across departments from 19.9% to 30.8% (excluding Conrad, which is comprised entirely of professional master's graduate students).

Figure 108: Graduate Proportion of Total FTE Enrolment, 2009/10-2013/14 (C7)

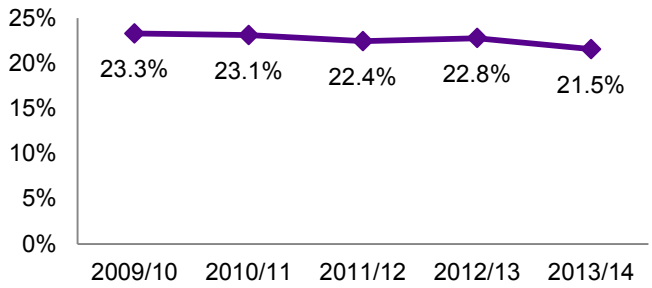


Figure 109 shows the trend in engineering graduate admissions by program type over the past four years, during which time total admissions were relatively stable but the distribution among programs varied slightly and the proportion of admitted students who are Canadian or permanent residents decreased. Figure 110 provides department-level detail of the most current year's admissions.

Figure 109: FTE Graduate Student Admissions, 2010-2013 (C4)

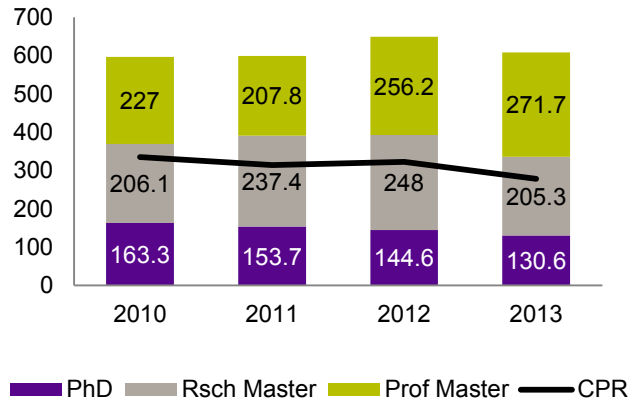
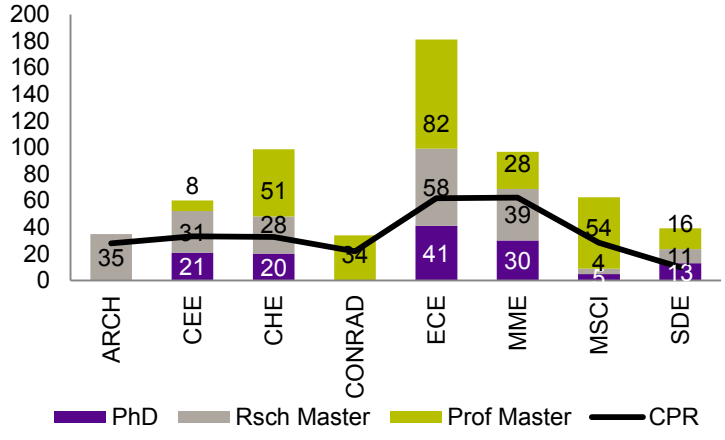


Figure 110: FTE Graduate Student Admissions, 2013 (C4)



We monitor average graduate student support (as shown in Figure 111 and Figure 112) because financial support for research graduate students has an important impact on the quality of our graduate student experience and on the competitiveness of our graduate recruitment efforts. Additionally, the proportion of students holding external scholarships can be considered a metric of student quality. For a more complete picture of total graduate student funding in each academic unit, it is important to consider also the enrolment in each unit (see Figure 105).

Figure 111: Graduate Student Financial Support, 2013/14: PhD Students (C8)

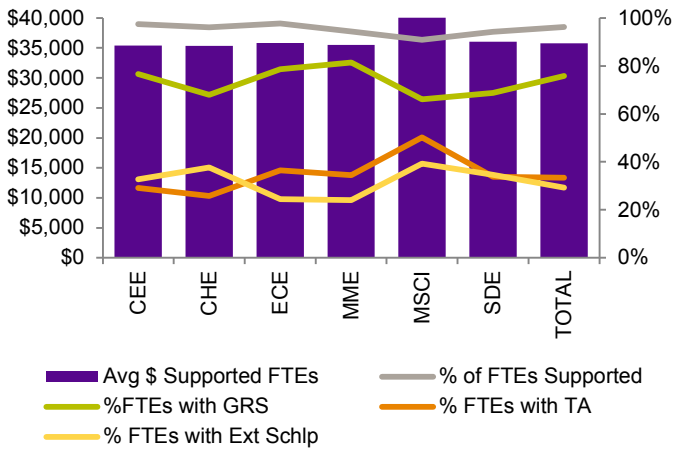


Figure 112: Graduate Student Financial Support, 2013/14: Research Master's Students (C8)

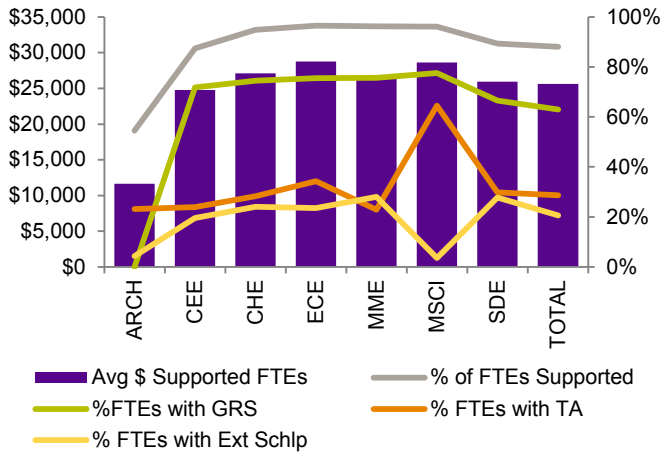
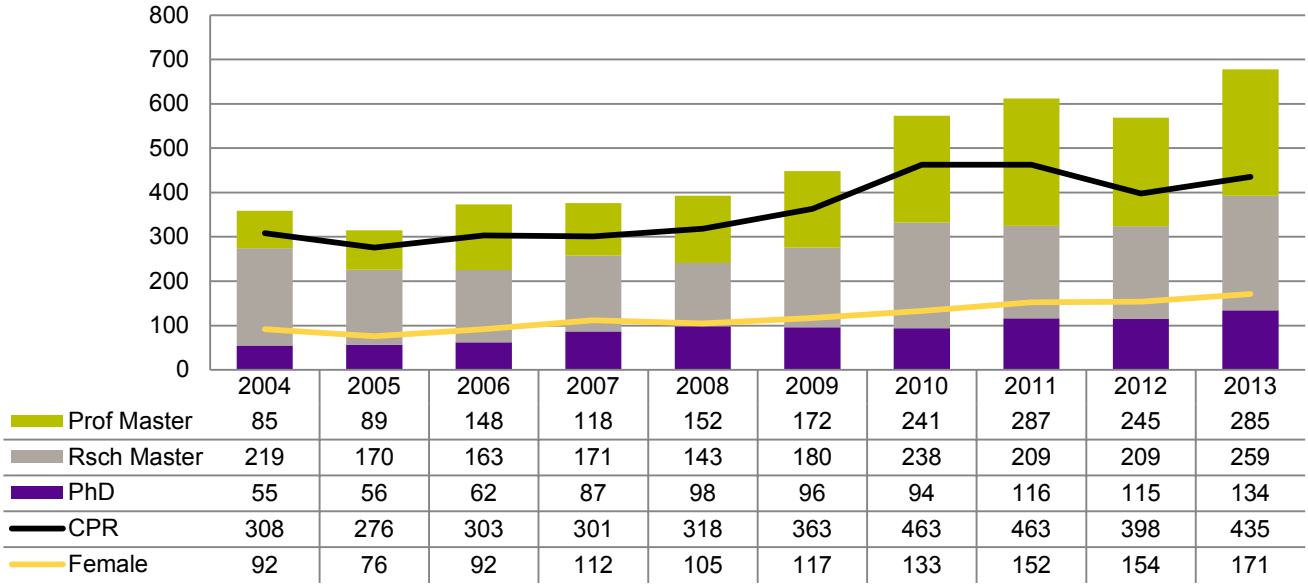


Figure 113: Graduate Degrees Granted, 2004-2013 (C3)



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Prof Master	85	89	148	118	152	172	241	287	245	285
Rsch Master	219	170	163	171	143	180	238	209	209	259
PhD	55	56	62	87	98	96	94	116	115	134
CPR	308	276	303	301	318	363	463	463	398	435
Female	92	76	92	112	105	117	133	152	154	171

Over the past 10 years, degrees awarded annually to Waterloo Engineering graduate students increased by 319 degrees or 89%, reaching records of 678 total degrees and 134 PhD degrees in 2013. Reflecting our increased research intensity, PhD degrees granted increased by 144%. The largest growth was in professional master's degrees granted (235%).

Figure 114 shows the distribution of degrees granted in 2013 by department, degree type and gender. Figure 116 normalizes that data to tenured/tenure-stream faculty. Figure 115 shows an increase this year in the overall five-year trend of that normalized indicator.

Figure 114: Graduate Degrees Granted, 2013 (C3)

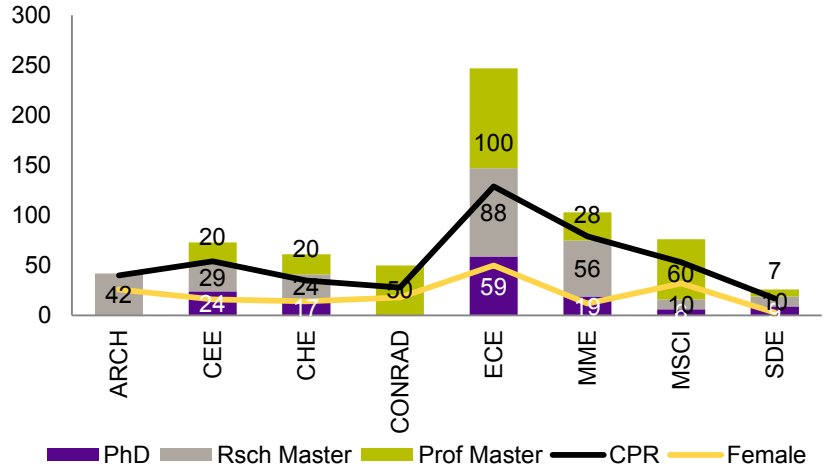


Figure 115: Graduate Degrees Granted per TTS Faculty Member, 2009/10-2013/14 (C6)

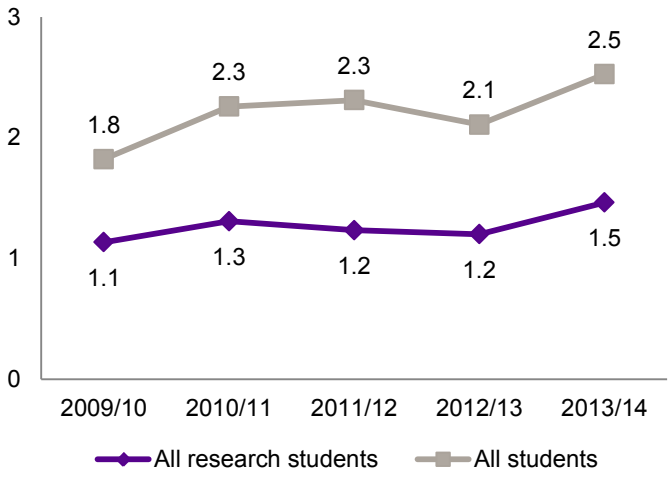
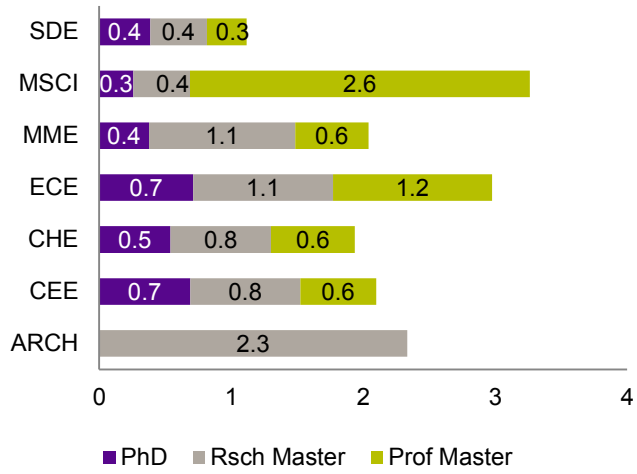


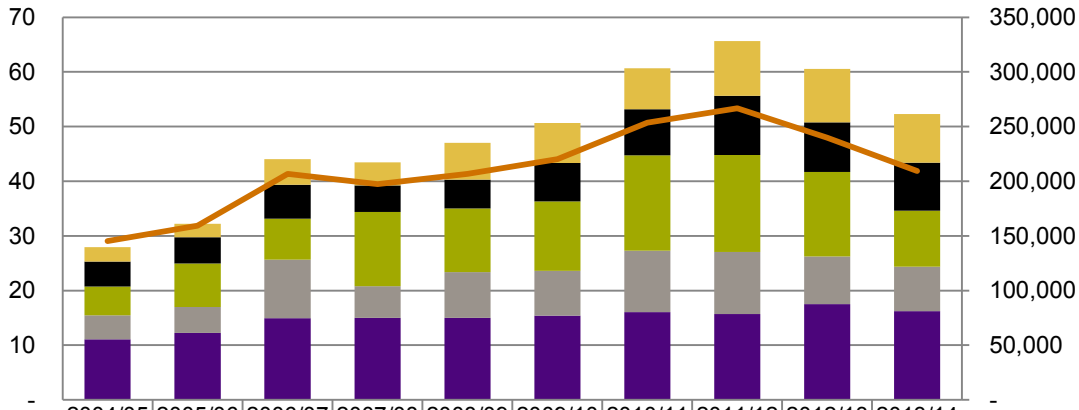
Figure 116: Graduate Degrees Granted per TTS Faculty Member, 2013/14 (C6)



** graph excludes Conrad, which awarded 12.5 professional master's degrees per TTS faculty in 2013/14.*

D. Research

Figure 117: Research Funds by Sector ($millions) and per TTS Faculty Member, 2004/05-2013/14 (D1&D7)



	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Other	2.66	2.46	4.69	4.23	6.70	7.32	7.50	10.03	9.79	8.90
Industry	4.55	4.78	6.22	4.83	5.30	7.04	8.45	10.83	9.03	8.79
Provincial	5.27	7.97	7.48	13.60	11.68	12.69	17.44	17.73	15.46	10.26
Federal	4.38	4.75	10.72	5.82	8.36	8.20	11.26	11.38	8.75	8.14
Tri-Council	11.10	12.26	14.95	14.99	14.98	15.43	16.04	15.70	17.52	16.22
Funding per TTS Faculty	145,261	159,465	206,725	197,405	206,809	220,084	253,689	266,868	239,899	209,374

In 2013/14, research funding to Waterloo Engineering faculty members totalled $52.3 million or $209,374 per tenured/tenure-stream faculty member. While this total is 88% higher than the total 10 years ago (and funding per tenured/tenure-stream faculty has increased by 44% over the same time period), it is over $13 million lower than our record total research funding in 2011/12. This decline in recent years is due in part to changes in government program budgets: of note, the Ontario Research Fund-Research Excellence program was deferred for more than a year. (The impact of this change is reflected in the 42% decrease in provincial funding over the last two years.) From 2004/05 to 2013/14, growth in industry funding (93%) more than doubled the rate of growth in Tri-Council funding (46%), a necessary expansion of funding sources outside of government programs.

Figure 118: Research Funds by Sector ($millions), 2013/14 (D1)

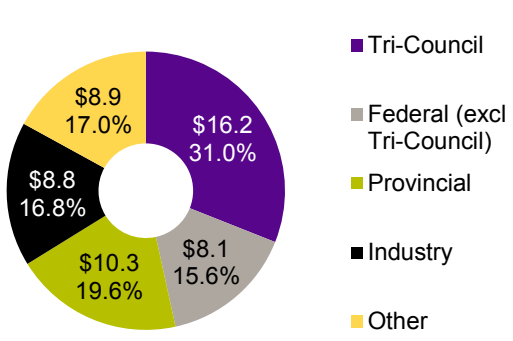
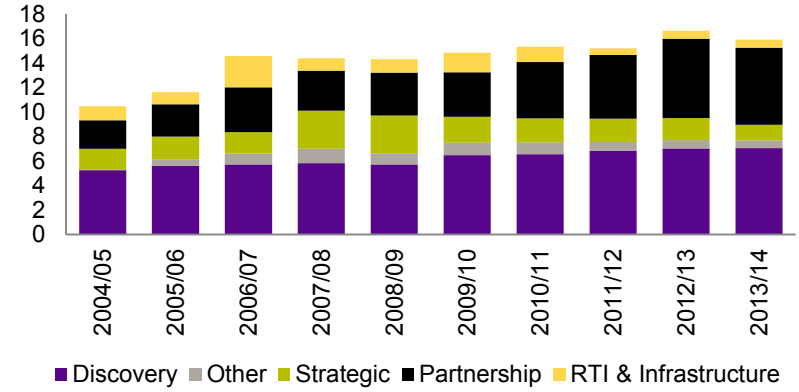


Figure 119: NSERC Funding by Type ($millions), 2004/05-2013/14 (D3)



In 2013/14, Waterloo Engineering external research funding totalled $52,312,631 or $209,374 per tenured/tenure-stream faculty member. The relative distribution of funding by sector is shown in Figure 118.

As noted above, Tri-Council funding increased by 46% between 2004/05 and 2013/14. This growth is further explored in Figure 119, by NSERC program type. In 2013/14, 31% of research funding came from the Federal Tri-Council granting agencies, largely NSERC. The distribution of Tri-Council funding and of NSERC funding by program in 2013/14 is provided in Figure 120.

Figure 120: Tri-Council Funding and NSERC Funding by Type ($millions), 2013/14 (D2&D3)

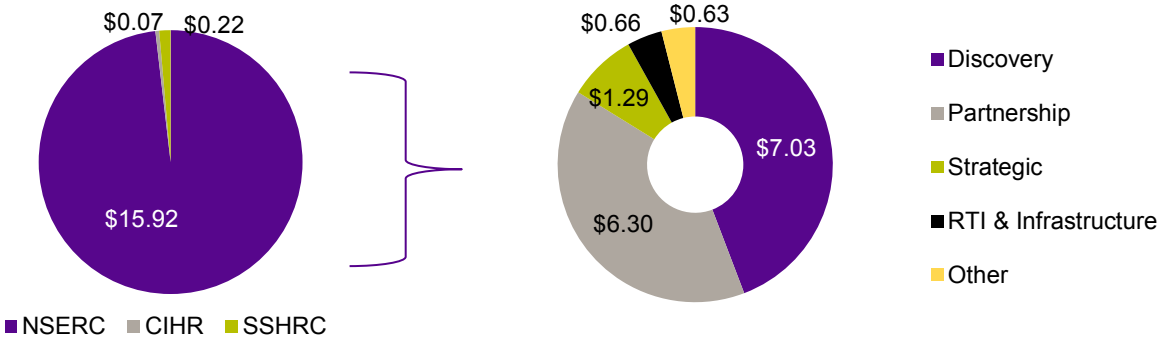


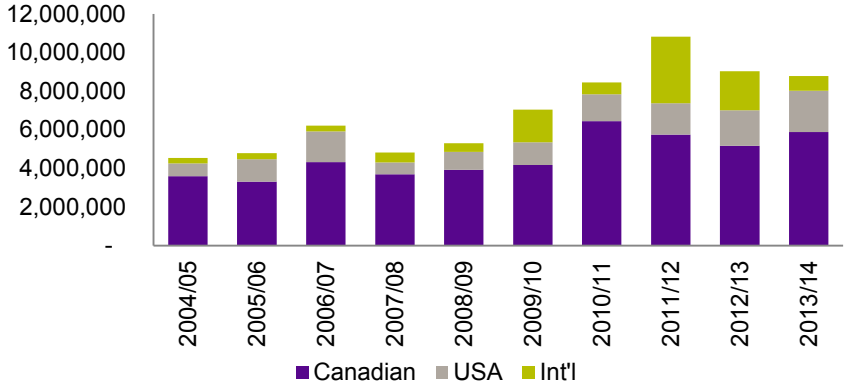
Figure 121: University of Waterloo Share of NSERC Awards in Engineering Subjects, 2009/10-2013/14 (D4)*

Figure 122: University of Waterloo Share of NSERC Funding in Engineering Subjects, 2009/10-2013/14 (D4)*

Another context to assess our NSERC funding performance is the proportion of total funding and awards available from NSERC programs that we are earning annually. Figure 121 and Figure 122 show relatively stable performance over the past five years by University of Waterloo researchers in NSERC subject areas related to engineering.

**Because these data are provided by NSERC research area and not by academic department, they will include some researchers outside the Faculty of Engineering and will exclude some Faculty of Engineering researchers.*

Figure 123: Industry Research Funding by Region, 2004/05-2013/14 (D6)



As noted above, industry research funding increased by 93% between 2004/05 and 2013/14. As seen in Figure 123, a significant proportion of this growth results from investment from outside Canada, which increased by over 200% between 2004/05 and 2013/14.

Funding cannot be our sole measure of research success. Another indicator of research excellence can be seen through major research chair holders. As of May 1, 2014, 39 Waterloo Engineering faculty members (14.5% of the tenured/tenure-stream complement) hold major research chairs. An additional four faculty members are university professors.

This progress report also marks the first publication of a selection of bibliometric indicators to provide additional insight into our scholarly output and research impact (Figure 125 to Figure 127). These measures are intended as an initial report of publication and citation activity, which we expect to enhance over time.

Figure 124: Research Chair Holders, 2014 (D9)

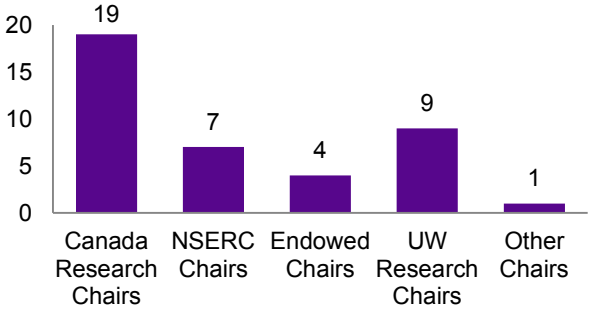
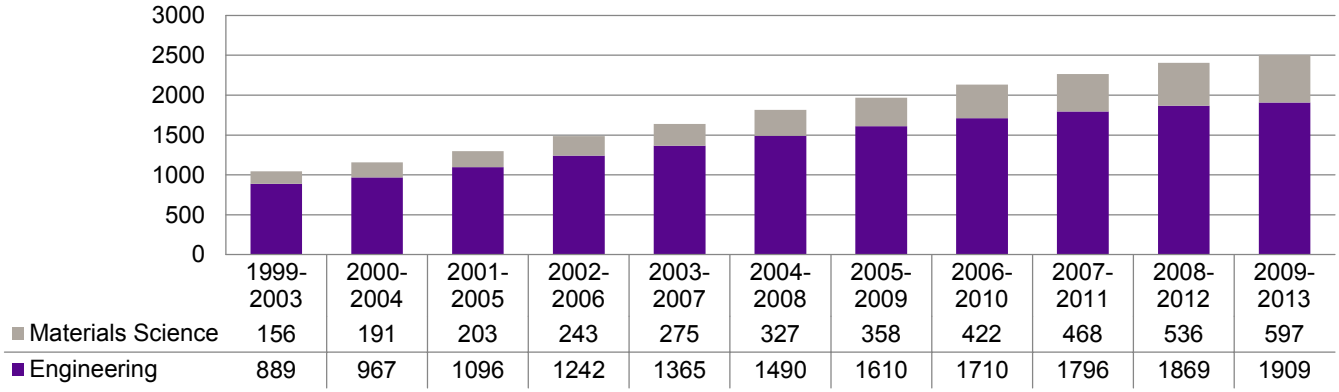


Figure 125: University of Waterloo Publications in Thomson Reuters-indexed Journals Classified as Engineering or Materials Science (D10)*



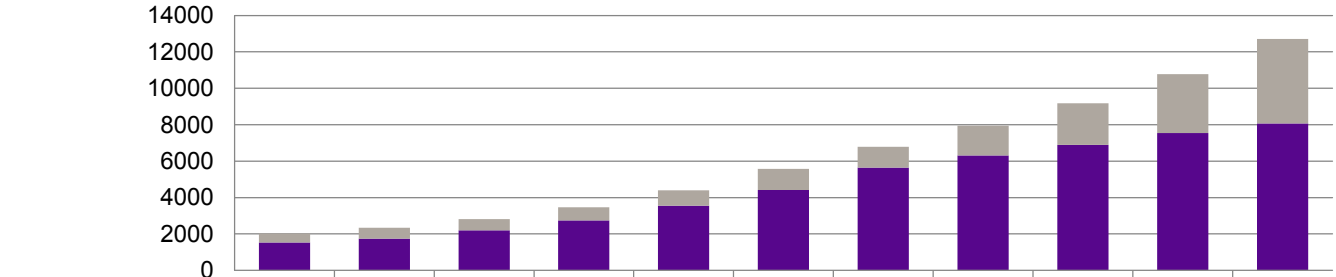
	1999-2003	2000-2004	2001-2005	2002-2006	2003-2007	2004-2008	2005-2009	2006-2010	2007-2011	2008-2012	2009-2013
Materials Science	156	191	203	243	275	327	358	422	468	536	597
Engineering	889	967	1096	1242	1365	1490	1610	1710	1796	1869	1909

Figure 125 shows University of Waterloo research output in the scholarly areas where Faculty of Engineering researchers are most active, based on a sample of publications data. Publications data here are limited to those journals that are indexed by Thomson Reuters and include all publications by University of Waterloo-affiliated individuals in journals classified as engineering or materials science.* Waterloo Engineering researchers also publish regularly in journals classified as computer science; however, that discipline significantly publishes in conference proceedings, which are not indexed in the data tool used for this analysis. Due to this difference in data available based on discipline, we have not presented computer science journal publication or citation data here.

Within this sample, from 1999-2003 to 2009-13, University of Waterloo publications increased by 115% in engineering journals and by 283% in materials science journals. Though not analyzed here, it is of note that over the same time period Waterloo publications also increased (by over 90%) in computer science journals, excluding conference proceedings. The five-year period from 2009-2013 saw record high numbers of Waterloo publications in engineering (1,909) and materials science (597) journals.

Figure 126 examines the impact of these publications, providing the number of citations in Thomson Reuters-indexed journals to the papers that make up the sample represented in Figure 125. Because the time periods specified in these data apply to the publication date of both the cited document and the citing article, the growth curve naturally starts from a relatively low number and grows over time as the number of cited publications increases (as shown in Figure 125) and as the included publications gain larger readership and increasing citations.

Figure 126: Citations to University of Waterloo Publications in Thomson Reuters-indexed Journals Classified as Engineering or Materials Science (D11)*



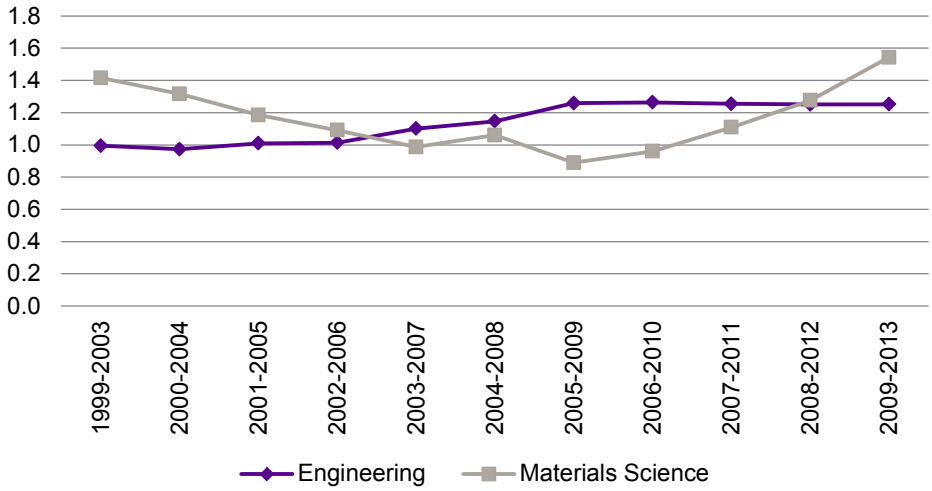
	1999-2003	2000-2004	2001-2005	2002-2006	2003-2007	2004-2008	2005-2009	2006-2010	2007-2011	2008-2012	2009-2013
Materials Science	483	596	610	730	834	1153	1158	1626	2285	3229	4631
Engineering	1537	1742	2208	2743	3559	4424	5639	6314	6896	7550	8076

Because publication expectations and citation practices vary among research disciplines, it is not meaningful to compare bibliometric data among disciplines. To that end, the data presented in the two graphs above will be considered over time within each subject area, but comparisons will not be made between the areas.

Figure 127 addresses this challenge by presenting a normalized indicator of impact for the data presented in Figure 125 and Figure 126 for each of the journal classifications we are tracking. This metric measures Waterloo's impact (citations per document) in the specified subject area relative to the impact of all institutions in the same subject area overall. In this way, comparisons can be made among subjects by noting to what extent the institution is under- or over-performing the overall system norm for that specific subject.

In recent history, Waterloo's impact relative to the subject areas we are tracking has consistently met or exceeded 1.0, which indicates that Waterloo's impact in the subject area is equal to or greater than the average impact in the subject area overall. Waterloo's subject-relative impact in engineering increased to 1.3 in the 2005-2009 time period and has remained stable since. In materials science, Waterloo's subject-relative impact has steadily increased in recent years, reaching 1.5 in the most recent five-year period. It is likely that faculty growth in support of new undergraduate programs in nanotechnology and mechatronics is contributing to this increase.

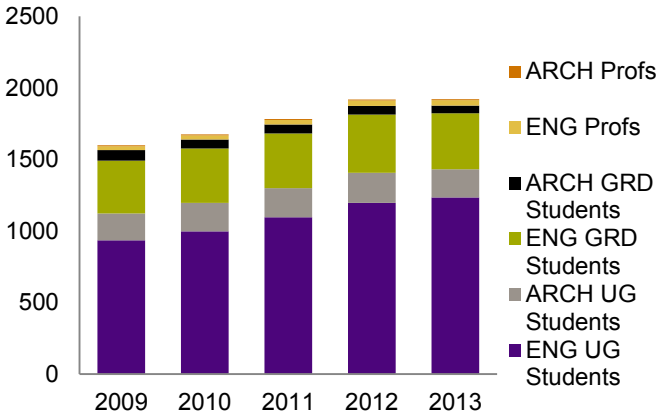
Figure 127: Impact Relative to Subject Area (Engineering or Materials Science) of University of Waterloo Publications in Thomson Reuters-indexed Journals (D12)*



**Because the data presented in Figure 125 to Figure 127 are provided by Thomson Reuters journal classification and not by academic department, they will include researchers outside the Faculty of Engineering who are publishing in engineering or materials science journals and will exclude some Faculty of Engineering researchers who publish outside these areas.*

E. Women in Engineering

Figure 128: Women in Engineering and Architecture, 2009-2013 (A1&B1&C1)



The total number of women students and faculty in the Faculty of Engineering has increased by 20% over the past four years, to reach 1,921.

As we work to increase the participation of women in engineering disciplines specifically, it is a positive indicator that the number of women at all levels in engineering programs has increased over the past five years: undergraduate students have increased over 32% to 1,234; graduate students have increased 6.5% to 392; and faculty have increased 34.5% to 37.

Figure 129 and Figure 130 provide details of the current participation of women in our engineering programs and in our School of Architecture.

Figure 129: Women in Engineering Programs, 2013 (E1)

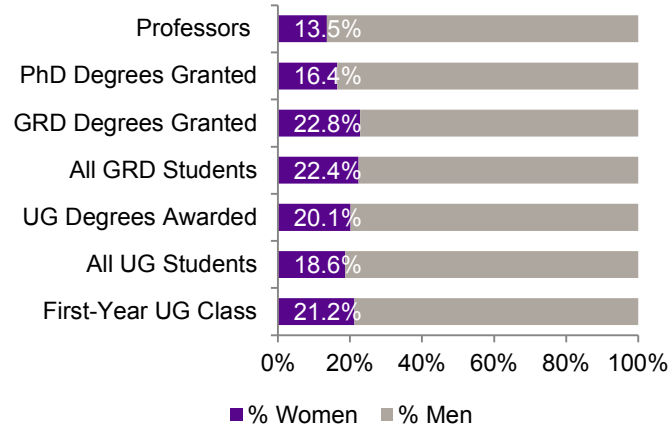
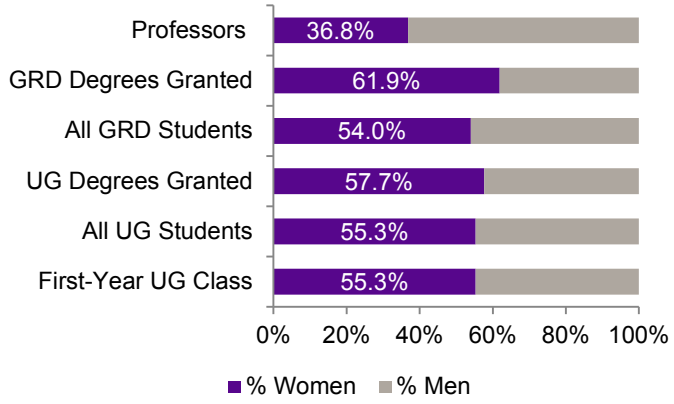


Figure 130: Women in Architecture, 2013 (E2)



F. Internationalization

Over the past five years, international student enrolment in undergraduate programs has increased by 109% to 782 and in graduate programs by 48% to 824.

While the percentage growth in international undergraduate students might appear high, it must be noted this growth is over a very low baseline. Over the past decade, we have added international places incrementally to our existing domestic undergraduate intake targets.

The current proportion of undergraduate students who are international is 11% (see Figure 132). International students now account for 44.5% of graduate students.

Figure 131: International Students, 2009-2013 (B1&C1)

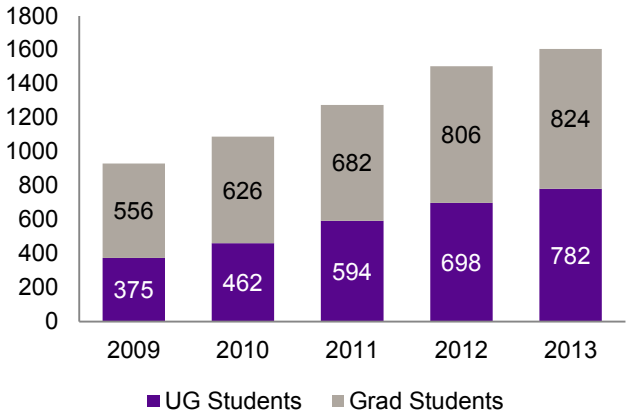
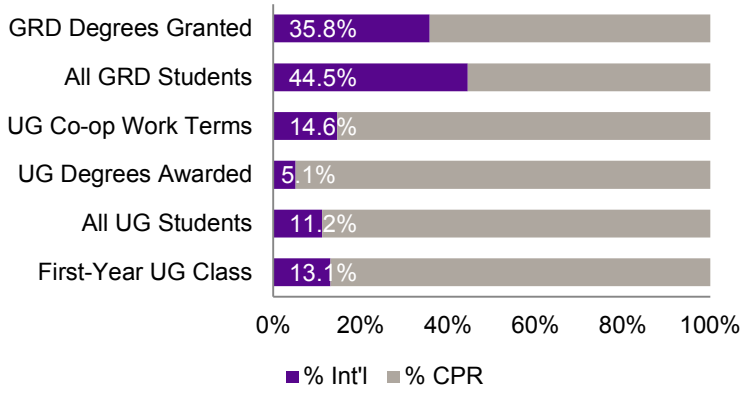


Figure 132: International Students, 2013 (F1)



Our efforts to increase international opportunities for undergraduate students have proven successful, with the number of international co-op terms growing by 77% (to a record 1,122) and outgoing exchange students growing by 42% (to 105) over the past five years (see Figure 133).

Figure 134 shows the composition of our industrial research funding in 2013/14, with a third of our industrial research funding coming from outside Canada in the past year.

Figure 133: International Opportunities for Undergraduate Students, 2009-2013 (B8&B10)

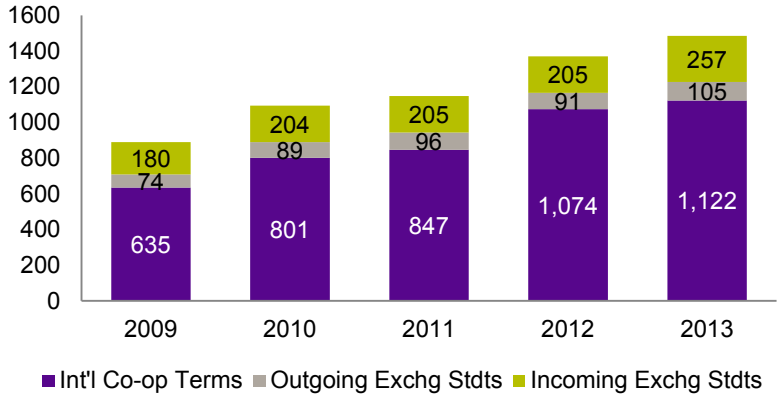
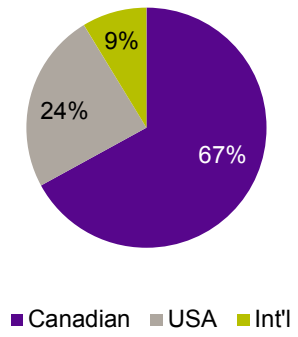
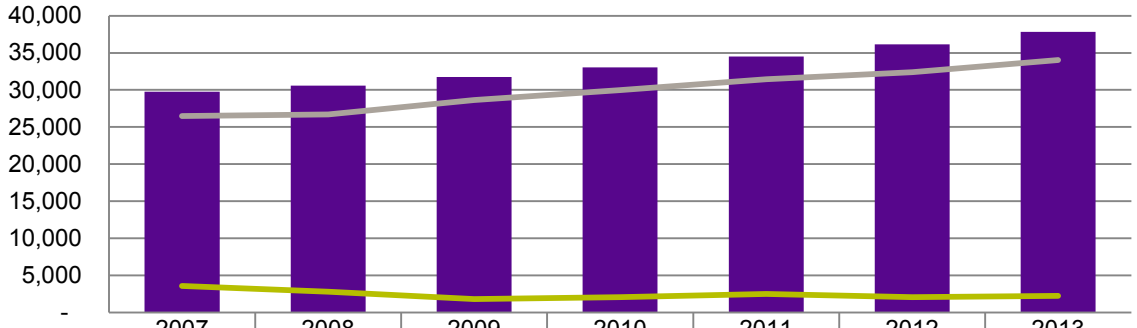


Figure 134: Industry Research Funding by Source Region, 2013/14 (D6)



G. Advancement

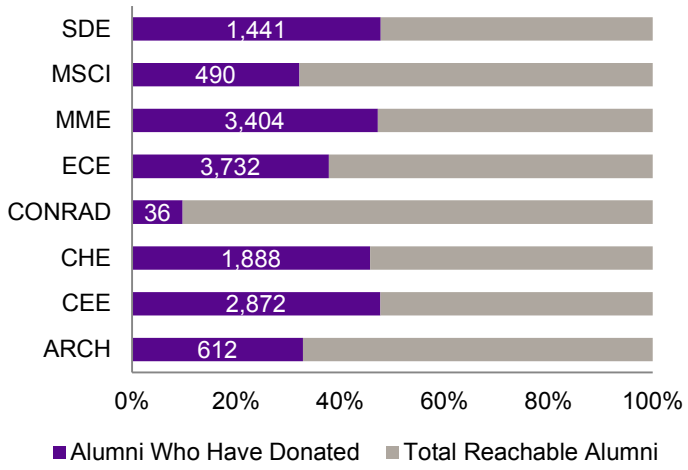
Figure 135: Alumni, 2007-2013 (G1&G2)



	2007	2008	2009	2010	2011	2012	2013
Total Alumni	29,752	30,601	31,754	33,032	34,511	36,140	37,826
Reachable Alumni	26,495	26,683	28,624	29,981	31,424	32,383	34,016
Alumni Who Donated	3,576	2,816	1,800	2,068	2,483	2,072	2,226

As of December 31, 2013 Waterloo Engineering had graduated a total of 37,826 alumni, for 90% of whom the Office of Alumni Affairs had at least one method of contact. Of those, 6.5% made a donation to the University of Waterloo in 2013. Figure 135 shows the proportion of alumni for whom we have a method of contact and the proportion choosing to make a donation to Waterloo in each year over the past seven years.

Figure 136: Alumni Who Have Donated to UW as of May 1, 2014 (G3)



In addition to the number of alumni who choose to make a gift to the University of Waterloo in each year, another important indicator of the degree of affinity our alumni feel for their alma mater is the proportion of all alumni who have ever, over their "lifetime" as an alumnus, made a donation to the University. As of December 31, 2013 over 42% of all Waterloo Engineering alumni had done so (see Figure 136 for departmental distribution).

Alumni donations are part of the overall picture of philanthropic support that helps move Waterloo Engineering' forward. Figure 137 details total funds raised for Waterloo Engineering in the past four years. As of May 1, 2014 we had reached 109% of our current campaign goal; as shown in Figure 138, progress varies by priority area.

Figure 137: Funds Raised ($millions), 2010/11-2013/14 (G4)

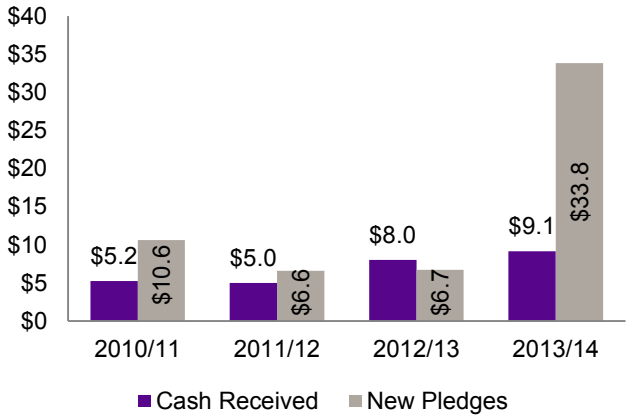
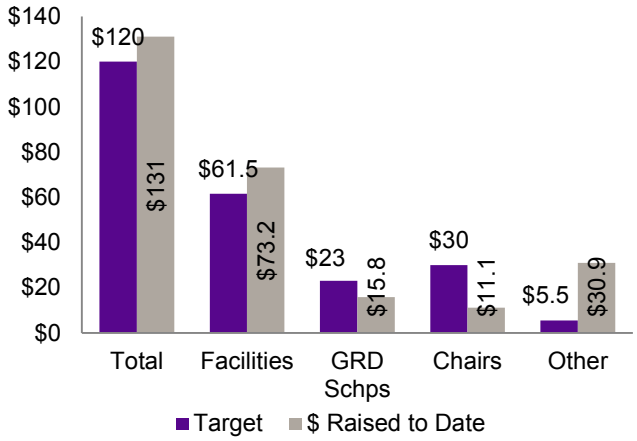
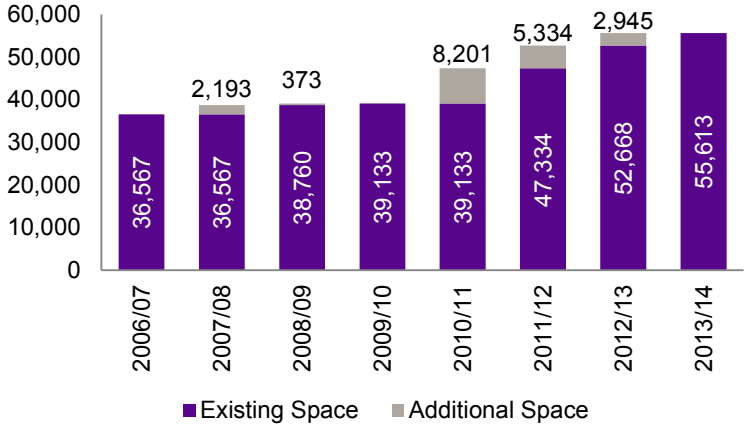


Figure 138: Campaign Progress ($millions) as of May 1, 2014 (G5)



H. Space

Figure 139: Space Holdings (nasm), 2006/07-2013/14 (H1)



Waterloo Engineering space holdings have increased by 19,046 nasm (52%) over the past eight years, to reach 55,613 nasm. While this is a significant achievement, space limitations remain the most pressing constraint to the achievement of many of our plan goals.

V. Appendices

The tables appended here contain the data provided to all Waterloo Engineering units in order to assist in their planning and annual plan review and progress update. Appendix I provides the definitions and sources used to create these data.

A. Faculty and Staff Data Tables

1. Total Regular Faculty, 2009/10

Department	Prof	Assoc Prof	Asst Prof	Lect	Total	# Female	% Female
Architecture	1.0	11.0	3.0	1.0	16.0	6.0	37.5%
Conrad	1.0	0.0	0.0	2.0	3.0	0.0	0.0%
Chemical	18.0	7.0	6.0	0.0	31.0	2.0	6.5%
Civil & Environmental	18.3	6.5	8.5	2.0	35.3	3.0	8.5%
Electrical & Computer	29.0	26.0	18.0	4.5	77.5	8.0	10.3%
Management Sciences	7.3	6.0	6.0	1.0	20.3	5.0	24.7%
Mechanical & Mechatronics	26.0	7.0	17.0	1.0	51.0	9.0	17.6%
Systems Design	9.0	10.3	4.0	2.0	25.3	4.0	15.8%
Administrative Units	0.0	0.0	0.0	1.0	1.0	0.0	0.0%
TOTAL	109.5	73.8	62.5	14.5	260.3	37.0	14.2%

Total Regular Faculty, 2010/11

Department	Prof	Assoc Prof	Asst Prof	Lect	Total	# Female	% Female
Architecture	1.0	11.0	3.0	1.0	16.0	6.0	37.5%
Conrad	2.0	0.0	0.0	1.0	3.0	0.0	0.0%
Chemical	21.0	6.0	6.0	2.0	35.0	2.0	5.7%
Civil & Environmental	20.3	6.0	8.0	2.0	36.3	3.0	8.3%
Electrical & Computer	31.0	26.0	20.0	4.5	81.5	9.0	11.0%
Management Sciences	7.3	4.0	9.0	2.0	22.3	5.0	22.5%
Mechanical & Mechatronics	25.0	11.0	15.0	1.5	52.5	9.0	17.1%
Systems Design	10.0	6.3	5.0	2.0	23.3	4.0	17.2%
Administrative Units	0.0	0.0	0.0	1.5	1.5	0.0	0.0%
TOTAL	117.5	70.3	66.0	17.5	271.3	38.0	14.0%

Total Regular Faculty, 2011/12

Department	Prof	Assoc Prof	Asst Prof	Lect	Total	# Female	% Female
Architecture	2.0	11.0	3.0	2.0	18.0	7.0	38.9%
Conrad	2.0	1.0	0.0	1.0	4.0	0.0	0.0%
Chemical	21.0	6.0	7.0	4.0	38.0	3.0	7.9%
Civil & Environmental	20.3	6.0	10.0	2.0	38.2	4.0	10.5%
Electrical & Computer	33.0	26.0	18.0	4.5	81.5	9.0	11.0%
Management Sciences	8.3	4.0	12.0	2.0	26.3	6.0	22.9%
Mechanical & Mechatronics	26.0	13.0	13.0	1.5	53.5	9.0	16.8%
Systems Design	10.0	7.3	5.0	2.0	24.3	4.0	16.4%
Administrative Units	0.0	0.0	0.0	2.5	2.5	1.0	39.8%
TOTAL	122.5	74.3	68.0	21.5	286.3	43.0	15.0%

Total Regular Faculty, 2012/13

Department	Prof	Assoc Prof	Asst Prof	Lect	Total	# Female	% Female
Architecture	2.0	12.0	3.0	2.0	19.0	7.0	36.8%
Conrad	1.0	3.0	0.0	1.0	5.0	1.0	20.0%
Chemical	23.0	3.0	7.0	3.0	36.0	3.0	8.3%
Civil & Environmental	20.3	10.0	6.5	2.0	38.8	4.5	11.6%
Electrical & Computer	35.0	26.0	21.0	4.5	86.5	9.0	10.4%
Management Sciences	8.3	4.0	11.0	4.0	27.3	6.0	22.0%
Mechanical & Mechatronics	25.5	16.0	10.0	1.5	53.0	8.5	16.0%
Systems Design	10.3	7.0	5.0	2.0	24.3	4.0	16.4%
Administrative Units	0.0	0.0	0.0	2.5	2.5	1.0	39.8%
TOTAL	125.3	81.0	63.5	22.5	292.3	44.0	15.1%

Total Regular Faculty, 2013/14

Department	Prof	Assoc Prof	Asst Prof	Lect	Total	# Female	% Female
Architecture	4.0	12.0	2.0	2.0	20.0	9.0	45.0%
Conrad	1.0	3.0	0.0	2.0	6.0	1.0	16.7%
Chemical	21.5	6.0	4.0	3.0	34.5	4.0	11.6%
Civil & Environmental	18.3	10.0	6.5	2.0	36.8	4.5	12.2%
Electrical & Computer	36.0	27.0	20.0	4.5	87.5	10.0	11.4%
Management Sciences	8.3	4.0	11.0	3.0	26.3	7.0	26.6%
Mechanical & Mechatronics	24.5	18.0	8.0	2.5	53.0	8.5	16.0%
Systems Design	12.3	5.0	6.0	2.0	25.3	4.0	15.8%
Administrative Units	0.0	0.0	0.0	2.5	2.5	1.0	40.0%
TOTAL	125.9	85.0	57.5	23.5	291.9	49.0	16.8%

2. Distribution of Regular Faculty by PEng Status, 2010/11

Department	Registered	Applied	Not Applied	Not Eligible	Total
Chemical	20.0	7.0	8.0	0.0	35.0
Civil & Environmental	27.8	1.0	7.5	0.0	36.3
Electrical & Computer	45.5	12.0	24.0	0.0	81.5
Management Sciences	2.3	11.0	4.0	5.0	22.3
Mechanical & Mechatronics	38.5	9.0	5.0	0.0	52.5
Systems Design	12.3	2.0	7.0	0.0	21.3
Administrative Units	1.5	0.0	0.0	0.0	1.5
TOTAL	147.8	42.0	55.5	5.0	250.3

Distribution of Regular Faculty by PEng Status, 2011/12

Department	Registered	Applied	Not Applied	Not Eligible	Total
Chemical	20.0	8.0	10.0	0.0	38.0
Civil & Environmental	27.8	1.0	9.5	0.0	38.2
Electrical & Computer	48.5	9.0	24.0	0.0	81.5
Management Sciences	9.3	6.0	6.0	5.0	26.3
Mechanical & Mechatronics	41.5	8.0	4.0	0.0	53.5
Systems Design	12.3	2.0	7.0	1.0	22.3
Administrative Units	1.5	1.0	0.0	0.0	2.5
TOTAL	160.8	35.0	60.5	6.0	262.3

Distribution of Regular Faculty by PEng Status, 2012/13

Department	Registered	Applied	Not Applied	Not Eligible	Total
Chemical	20.0	7.0	9.0	0.0	36.0
Civil & Environmental	29.8	3.0	6.0	0.0	38.8
Electrical & Computer	49.5	11.0	26.0	0.0	86.5
Management Sciences	12.3	6.0	4.0	5.0	27.3
Mechanical & Mechatronics	43.0	5.0	5.0	0.0	53.0
Systems Design	14.3	2.0	10.0	1.0	27.3
Administrative Units	1.5	1.0	0.0	0.0	2.5
TOTAL	170.4	35.0	60.0	6.0	271.4

Distribution of Regular Faculty by PEng Status, 2013/14

Department	Registered	Applied	Not Applied	Not Eligible	Total
Chemical	22.0	7.0	5.5	0.0	34.5
Civil & Environmental	29.8	3.0	4.0	0.0	36.8
Electrical & Computer	50.5	13.0	24.0	0.0	87.5
Management Sciences	12.3	7.0	2.0	5.0	26.3
Mechanical & Mechatronics	45.0	5.0	3.0	0.0	53.0
Systems Design	14.3	4.0	5.0	2.0	25.3
Administrative Units	1.5	1.0	0.0	0.0	2.5
TOTAL	174.4	39.0	45.5	7.0	265.9

3. Distribution of Regular Faculty by Age, 2010/11-2013/14

Age Range	2010/11	2011/12	2012/13	2013/14
<30	6.0	5.0	3.0	0.0
30-34	21.0	21.0	23.0	17.0
35-39	45.3	48.0	44.5	48.5
40-44	42.0	43.3	45.3	48.3
45-49	43.0	46.0	39.0	38.0
50-54	57.0	48.0	58.0	53.5
55-59	26.0	37.5	38.5	43.5
60-64	19.0	23.5	24.5	25.5
65+	12.0	14.0	16.5	16.5
Unknown				1.0
TOTAL	271.3	286.3	292.3	291.8

4. Distribution of TTS Faculty by PhD School, 2010/11-2013/14

PhD School	2010/11	2011/12	2012/13	2013/14
Waterloo	68.0	64.0	64.0	64
Ontario	40.5	44.5	44.5	42
Canada	30.0	36.0	37.0	34
USA	60.0	70.8	74.33	77.3
International	37.0	39.0	38.5	40.5
TOTAL	235.5	254.3	258.3	257.8

5. Total Non-regular and Non-faculty Appointments, 2011/12

Department	Adjunct Profs	Lect (Adj/ Special)	Rsch Profs	Post Docs	Rsch Assocs	Visitors	Def-term Profs	Total
Architecture	12.0	4.0	0.0	0.0	0.0	0.0	0.0	16.0
Conrad	4.0	1.0	0.0	1.0	0.0	0.0	1.0	7.0
Chemical	24.0	0.0	1.0	27.0	16.0	45.0	0.0	113.0
Civil & Environmental	51.0	7.0	3.0	12.0	6.0	8.0	2.0	89.0
Electrical & Computer	28.0	17.0	1.0	37.0	23.0	33.0	0.0	139.0
Management Sciences	13.0	4.0	0.0	0.0	0.0	1.0	0.0	18.0
Mechanical & Mechatronics	39.0	6.0	1.0	22.0	6.0	11.0	0.0	85.0
Systems Design	31.0	2.0	0.0	10.0	1.0	6.0	0.0	50.0
Administrative Units	3.0	0.0	0.0	0.0	0.0	0.0	1.0	4.0
TOTAL	205.0	41.0	6.0	109.0	52.0	104.0	4.0	521.0

Total Non-regular and Non-faculty Appointments, 2012/13

Department	Adjunct Profs	Lect (Adj/ Special)	Rsch Profs	Post Docs	Rsch Assocs	Visitors	Def-term Profs	Total
Architecture	12.0	4.0	0.0	0.0	0.0	0.0	0.0	16.0
Conrad	1.0	5.0	0.0	0.0	0.0	0.0	0.0	6.0
Chemical	23.0	2.0	1.0	26.0	9.0	38.0	1.5	100.5
Civil & Environmental	35.0	7.0	3.0	12.0	7.0	3.0	0.0	67.0
Electrical & Computer	28.0	16.0	0.0	41.0	30.0	35.0	0.0	150.0
Management Sciences	16.0	5.0	0.0	1.0	0.0	4.0	0.0	26.0
Mechanical & Mechatronics	34.0	8.0	1.0	23.0	10.0	18.0	0.0	94.0
Systems Design	34.0	2.0	0.0	9.0	2.0	12.0	2.0	61.0
Administrative Units	3.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
TOTAL	186.0	49.0	5.0	112.0	58.0	110.0	3.5	523.5

Total Non-regular and Non-faculty Appointments, 2013/14

Department	Adjunct Profs	Lect (Adj/ Special)	Rsch Profs	Post Docs	Rsch Assocs	Visitors	Def-term Profs	Total
Architecture	0.0	22.0	0.0	0.0	0.0	0.0	0.0	22.0
Conrad	1.0	4.0	0.0	0.0	0.0	0.0	0.0	5.0
Chemical	21.0	1.0	1.0	23.0	6.0	27.0	0.3	79.3
Civil & Environmental	28.0	5.0	4.0	10.0	6.0	10.0	0.0	63.0
Electrical & Computer	25.0	10.0	1.0	49.0	35.0	29.0	0.0	149.0
Management Sciences	18.0	7.0	0.0	2.0	0.0	2.0	0.5	29.5
Mechanical & Mechatronics	38.0	8.0	1.0	31.0	16.0	26.0	0.0	120.0
Systems Design	40.0	5.0	0.0	11.0	1.0	13.0	1.0	71.0
Administrative Units	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
TOTAL	172.0	62.0	7.0	126.0	64.0	107.0	1.8	539.8

6. Selected Major Faculty Awards and Honours, 2013

Department	Faculty Member	Award
Architecture	Haldenby, Eric	Lifetime Achievement Award, Canadian Council of University Schools of Architecture
	Sheppard, Lola	Canadian Pavilion Selection, 14th International Venice Biennale in Architecture
Chemical Engineering	Ng, Flora	Canadian Green Chemistry and Engineering Award
	Rempel, Garry	Queen Elizabeth II Diamond Jubilee Medal
Civil and Environmental Engineering	Brush, David	Faculty of Engineering Teaching Excellence Award
	Casello, Jeffrey	Distinguished Teacher Award, UW
	Haas, Carl	National Academy of Construction Award
	Huck, Peter	NSERC IRC
	Narasimhan, Sriram	The Alexander von Humboldt Fellowship for Experienced Researchers
	Tighe, Susan	Bleeds Black Award, Ontario Hot Mix Producers Association
Electrical and Computer Engineering	Boumaiza, Slim	Faculty of Engineering Research Excellence Award
	Ganesh, Vijay V.	Google Research Award
	Jayaram, Shesha	IEEE James R. Melcher Prize Paper Award
	Kulic, Danica D.	Faculty of Engineering Research Excellence Award
	Rosenberg, Catherine	Canadian Academy of Engineering Fellow
	Rosenberg, Catherine	Chair of the Orange Scientific Board
	Wang, David	Faculty of Engineering Teaching Excellence Award
	Yang, En-Hui	Chinese Professionals Assn of Canada Professional Achievement Award
Management Sciences	Abouee Mehrizi, Hossein	Canada Research Chair: Tier 2
	Elhedhli, Samir	Canadian Operations Research Society (CORS) Service Award
Mechanical and Mechatronics	Cronin, Duane	Distinguished Teacher Award, UW
	Hansson, Carolyn	Queen Elizabeth II Diamond Jubilee Medal

Department	Faculty Member	Award
Engineering	Jahed, Hamid	Faculty of Engineering Research Excellence Award
	Khajepour, Amir	En-hui Yang Engineering Research Innovation Award
	Khajepour, Amir	PEO Engineering Medal for Research and Development
	Schneider, Gerald	AIAA 2013 Thermophysics Award
	Sullivan, Pearl	Fellow, Institute of Materials, Minerals and Mining (UK)
	Hipel, Keith	Faculty of Engineering Teaching Excellence Award
Systems Design Engineering	Hipel, Keith	President of the Academy of Science, Royal Society of Canada
	Roe, Peter	Queen Elizabeth II Diamond Jubilee Medal
	Wong, Alexander	Canada Research Chair: Tier 2

7. FTE Staff, 2009/10

Department	Tech	Admin	Total	# Female	% Female
Architecture	4.0	6.0	10.0	6.0	60.0%
Conrad	0.0	3.0	3.0	3.0	100.0%
Chemical	10.0	5.0	15.0	7.0	46.7%
Civil & Environmental	9.0	7.0	16.0	8.0	50.0%
Electrical & Computer	26.0	15.6	41.6	21.6	51.9%
Management Sciences	1.0	6.0	7.0	6.0	85.7%
Mechanical & Mechatronics	17.0	12.0	29.0	12.0	41.4%
Systems Design	4.0	5.0	9.0	5.0	55.6%
Dean's Office-administration	0.0	13.8	13.8	11.8	85.5%
Dean's Office-advancement	0.0	11.8	11.8	8.8	74.6%
Dean's Office-research institutes	0.0	6.0	6.0	4.0	66.7%
Undergraduate Office	2.0	8.5	10.5	9.5	90.5%
Undergraduate Office-PDEng	0.0	8.0	8.0	5.0	62.5%
Engineering Computing	9.0	1.0	10.0	2.0	20.0%
Engineering Machine Shop	9.0	2.5	11.5	0.5	3.9%
TOTAL	91.0	111.1	202.1	110.1	54.5%

FTE Staff, 2010/11

Department	Tech	Admin	Total	# Female	% Female
Architecture	5.0	6.0	11.0	6.0	54.5%
Conrad	0.0	4.0	4.0	4.0	100.0%
Chemical	9.5	5.0	14.5	7.0	48.3%
Civil & Environmental	9.0	7.0	16.0	8.0	50.0%
Electrical & Computer	27.0	16.0	43.0	22.0	51.2%
Management Sciences	1.0	6.0	7.0	6.0	85.7%
Mechanical & Mechatronics	16.0	10.0	26.0	10.0	38.5%
Systems Design	4.0	5.0	9.0	5.0	55.6%
Dean's Office-administration	0.0	8.0	8.0	8.0	100.0%
Dean's Office-advancement	0.0	9.8	9.8	7.8	79.6%
Engineering Computing	10.0	1.0	11.0	2.0	18.2%
Engineering Machine Shop	9.0	2.5	11.5	0.5	3.9%
Graduate Office	0.0	2.0	2.0	2.0	100.0%
Outreach Office	0.0	1.0	1.0	0.0	0.0%
Research Office	0.0	2.0	2.0	1.0	50.0%
Research Institutes	0.0	6.0	6.0	4.0	66.7%
Undergraduate Office	2.0	9.5	11.5	9.5	82.6%
WatPD-Engineering	0.0	1.0	1.0	1.0	100.0%
TOTAL	92.5	101.8	194.3	103.8	53.4%

FTE Staff, 2011/12

Department	Tech	Admin	Total	# Female	% Female
Architecture	5.0	5.0	10.0	6.0	60.0%
Conrad	0.0	3.0	3.0	3.0	100.0%
Chemical	9.5	6.0	15.5	8.0	51.6%
Civil & Environmental	9.0	6.0	15.0	7.0	46.7%
Electrical & Computer	26.0	16.2	42.2	22.2	52.6%
Management Sciences	2.0	6.0	8.0	7.0	87.5%
Mechanical & Mechatronics	17.0	12.0	29.0	12.0	41.4%
Systems Design	4.0	4.0	8.0	4.0	50.0%
Dean's Office-administration	0.0	10.0	10.0	9.0	90.0%
Dean's Office-advancement	0.0	14.8	14.8	11.8	79.7%
Engineering Computing	9.8	1.0	10.8	1.8	16.7%
Engineering Machine Shop	9.0	1.0	10.0	0.0	0.0%
Graduate Office	0.0	2.0	2.0	2.0	100.0%
Outreach Office	0.0	2.0	2.0	1.0	50.0%
Research Office	0.0	2.0	2.0	1.0	50.0%
Research Institutes	0.0	6.0	6.0	4.0	66.7%
Undergraduate Office	0.0	13.5	13.5	11.5	85.2%
TOTAL	91.3	110.5	201.8	111.3	55.2%

FTE Staff, 2012/13

Department	Tech	Admin	Total	# Female	% Female
Architecture	4.0	5.0	9.0	5.0	55.6%
Conrad	0.0	3.0	3.0	3.0	100.0%
Chemical	11.5	6.0	17.5	9.0	51.4%
Civil & Environmental	9.0	6.0	15.0	7.0	46.7%
Electrical & Computer	26.0	20.2	46.2	26.2	56.7%
Management Sciences	2.0	7.0	9.0	7.0	77.8%
Mechanical & Mechatronics	17.0	12.0	29.0	12.0	41.4%
Systems Design	4.0	5.0	9.0	5.0	55.6%
Dean's Office-administration	0.0	11.0	11.0	9.0	81.8%
Dean's Office-advancement	0.0	14.8	14.8	12.8	86.5%
Engineering Computing	9.8	1.0	10.8	1.8	16.7%
Engineering Machine Shop	11.0	2.0	13.0	1.0	7.7%
Graduate Office	0.0	2.0	2.0	2.0	100.0%
Outreach Office	0.0	2.0	2.0	1.0	50.0%
Research Office	0.0	3.0	3.0	2.0	66.7%
Research Institutes	0.0	7.0	7.0	5.0	71.4%
Undergraduate Office	0.0	13.5	13.5	11.5	85.2%
TOTAL	94.3	120.5	214.8	120.3	56.0%

FTE Staff, 2013/14

Department	Tech	Admin	Total	# Female	% Female
Architecture	5.0	7.0	12.0	7.0	58.3%
Conrad	0.0	3.0	3.0	3.0	100.0%
Chemical	12.0	6.5	18.5	9.5	51.4%
Civil & Environmental	9.0	7.0	16.0	8.0	50.0%
Electrical & Computer	27.0	20.0	47.0	26.0	55.3%
Management Sciences	2.0	7.0	9.0	7.0	77.8%
Mechanical & Mechatronics	19.0	11.0	30.0	12.0	40.0%
Systems Design	5.0	5.0	10.0	5.0	50.0%
Dean of Engineering Office	0.0	11.0	11.0	9.0	81.8%
Engineering Advancement	0.0	15.8	15.8	13.8	87.3%
Engineering Computing	10.0	1.0	11.0	1.0	9.1%
Engineering Graduate Office	0.0	2.0	2.0	2.0	100.0%
Engineering Machine Shop	10.0	2.0	12.0	1.0	8.3%
Engineering Outreach Office	0.0	2.0	2.0	1.0	50.0%
Engineering Research Office	0.0	4.0	4.0	2.0	50.0%
Engineering Undergraduate Office	0.0	14.5	14.5	11.5	79.3%
Research Institutes	0.0	6.0	6.0	4.0	66.7%
TOTAL	99.0	124.8	223.8	122.8	54.9%

8. Distribution of FTE Staff by Age, 2010/11-2013/14

Age Range	2010/11	2011/12	2012/13	2013/14
<30	11.0	10.0	11.0	15.0
30-34	18.0	21.0	21.0	20.0
35-39	22.0	23.0	27.0	30.0
40-44	26.0	21.5	22.5	20.0
45-49	42.5	43.5	46.5	40.0
50-54	34.8	37.3	42.5	47.5
55-59	23.0	30.5	28.3	27.8
60+	17.0	15.0	16.0	22.5
unknown				1.0
TOTAL	194.3	201.8	214.8	223.8

9. Staff Awards and Honours, 2013

Department	Staff Member	Award
Chemical	Rosemarie Guderian	Dean of Engineering Outstanding Staff Performance Award
Electrical & Computer	Rossi Ivanova	Dean of Engineering Outstanding Staff Performance Award

10. Faculty:Staff Ratios, 2009/10

Department	Faculty to Admin Staff	Faculty to Tech Staff	Faculty to Total Staff
Architecture	2.64	4.00	1.60
Conrad	1.00	n/a	1.00
Chemical	6.20	3.10	2.07
Civil & Environmental	5.04	3.92	2.20
Electrical & Computer	4.97	2.98	1.86
Management Sciences	3.38	20.25	2.89
Mechanical & Mechatronics	4.25	3.00	1.76
Systems Design	5.06	6.33	2.81
FACULTY TOTAL	2.34	2.86	1.29
Academic Units Only	4.35	3.65	1.99

Faculty:Staff Ratios, 2010/11

Department	Faculty to Admin Staff	Faculty to Tech Staff	Faculty to Total Staff
Architecture	2.67	3.20	1.45
Conrad	0.75	n/a	0.75
Chemical	7.00	3.68	2.41
Civil & Environmental	5.18	4.03	2.27
Electrical & Computer	5.09	3.02	1.90
Management Sciences	3.71	22.25	3.18
Mechanical & Mechatronics	5.25	3.28	2.02
Systems Design	4.66	5.83	2.59
FACULTY TOTAL	2.66	2.93	1.40
Academic Units Only	4.57	3.77	2.07

Faculty: Staff Ratios, 2011/12

Department	Faculty to Admin Staff	Faculty to Tech Staff	Faculty to Total Staff
Architecture	3.60	3.60	1.80
Conrad	1.33	n/a	1.33
Chemical	6.33	4.00	2.45
Civil & Environmental	6.37	4.25	2.55
Electrical & Computer	5.03	3.13	1.93
Management Sciences	4.38	13.13	3.28
Mechanical & Mechatronics	4.46	3.15	1.84
Systems Design	6.08	6.08	3.04
FACULTY TOTAL	2.59	3.14	1.42
Academic Units Only	4.88	3.91	2.17

Faculty:Staff Ratios, 2012/13

Department	Faculty to Admin Staff	Faculty to Tech Staff	Faculty to Total Staff
Architecture	3.80	4.75	2.11
Conrad	1.67	n/a	1.67
Chemical	6.00	3.13	2.06
Civil & Environmental	6.46	4.31	2.58
Electrical & Computer	4.29	3.33	1.87
Management Sciences	3.89	13.63	3.03
Mechanical & Mechatronics	4.42	3.12	1.83
Systems Design	4.87	6.08	2.70
FACULTY TOTAL	2.43	3.10	1.36
Academic Units Only	4.52	3.94	2.11

Faculty:Staff Ratios, 2013/14

Department	Faculty to Admin Staff	Faculty to Tech Staff	Faculty to Total Staff
Architecture	2.86	4.00	1.67
Conrad	2.00	n/a	2.00
Chemical	5.31	2.88	1.86
Civil & Environmental	5.26	4.09	2.30
Electrical & Computer	4.38	3.24	1.86
Management Sciences	3.76	13.15	2.92
Mechanical & Mechatronics	4.82	2.79	1.77
Systems Design	5.06	5.06	2.53
FACULTY TOTAL	2.34	2.95	1.30
Academic Units Only	4.35	3.66	1.99

B. Undergraduate Studies Data Tables

1. Total Undergraduate Enrolment (head count), Fall 2009

Program	Total	#Female	% Female	#Int'l	% Int'l
Architecture	346	189	54.6%	9	2.6%
Chemical	591	203	34.3%	49	8.3%
UAE: Chemical	8	1	12.5%	7	87.5%
Civil	490	114	23.3%	29	5.9%
UAE: Civil	14	0	0.0%	14	100.0%
Computer	571	53	9.3%	41	7.2%
Electrical	901	85	9.4%	66	7.3%
Environmental	185	93	50.3%	10	5.4%
Geological	73	18	24.7%	2	2.7%
Management	158	49	31.0%	16	10.1%
Mechanical	832	64	7.7%	43	5.2%
Mechatronics	522	34	6.5%	42	8.0%
Nanotechnology	439	87	19.8%	17	3.9%
Software	442	38	8.6%	23	5.2%
Systems Design	370	95	25.7%	7	1.9%
TOTAL	5942	1123	18.9%	375	6.3%

Total Undergraduate Enrolment (head count), Fall 2010

Program	Total	#Female	% Female	#Int'l	% Int'l
Architecture	368	200	54.3%	8	2.2%
Chemical	588	206	35.0%	59	10.0%
UAE: Chemical	30	6	20.0%	28	93.3%
Civil	506	109	21.5%	31	6.1%
UAE: Civil	22	3	13.6%	19	86.4%
Computer	611	58	9.5%	43	7.0%
Electrical	946	89	9.4%	69	7.3%
Environmental	223	104	46.6%	13	5.8%
Geological	81	26	32.1%	1	1.2%
Management	211	61	28.9%	23	10.9%
Mechanical	845	61	7.2%	55	6.5%
Mechatronics	538	44	8.2%	41	7.6%
Nanotechnology	494	93	18.8%	32	6.5%
Software	491	45	9.2%	30	6.1%
Systems Design	392	92	23.5%	10	2.6%
TOTAL	6346	1197	18.9%	462	7.3%

Total Undergraduate Enrolment (head count), Fall 2011

Program	Total	#Female	% Female	#Int'l	% Int'l
Architecture	352	204	58.0%	7	2.0%
Chemical	594	198	33.3%	69	11.6%
UAE: Chemical	56	17	30.4%	49	87.5%
Civil	527	125	23.7%	41	7.8%
UAE: Civil	46	9	19.6%	35	76.1%
Computer	625	53	8.5%	48	7.7%
Electrical	921	91	9.9%	84	9.1%
Environmental	245	116	47.3%	15	6.1%
Geological	88	22	25.0%	2	2.3%
Management	257	83	32.3%	34	13.2%
Mechanical	878	80	9.1%	74	8.4%
Mechatronics	562	52	9.3%	54	9.6%
Nanotechnology	488	97	19.9%	36	7.4%
Software	503	52	10.3%	35	7.0%
Systems Design	412	101	24.5%	11	2.7%
TOTAL	6554	1300	19.8%	594	9.1%

Total Undergraduate Enrolment (head count), Fall 2012

Program	Total	#Female	% Female	#Int'l	% Int'l
Architecture	370	209	56.5%	5	1.4%
Chemical	616	202	32.8%	81	13.1%
UAE: Chemical	62	16	25.8%	50	80.6%
Civil	554	134	24.2%	60	10.8%
UAE: Civil	57	8	14.0%	45	78.9%
Computer	682	59	8.7%	68	10.0%
Electrical	914	97	10.6%	103	11.3%
Environmental	249	124	49.8%	16	6.4%
Geological	102	26	25.5%	2	2.0%
Management	280	94	33.6%	33	11.8%
Mechanical	911	93	10.2%	94	10.3%
Mechatronics	610	66	10.8%	62	10.2%
Nanotechnology	504	100	19.8%	36	7.1%
Software	517	61	11.8%	38	7.4%
Systems Design	412	117	28.4%	10	2.4%
TOTAL	6840	1406	20.6%	703	10.3%

Total Undergraduate Enrolment (head count), Fall 2013

Program	Total	#Female	% Female	#Int'l	% Int'l
Architecture	356	197	55.3%	9	2.5%
Chemical	715	220	30.8%	135	18.9%
Civil	616	156	25.3%	102	16.6%
Computer	737	65	8.8%	83	11.3%
Electrical	835	84	10.1%	110	13.2%
Environmental	253	124	49.0%	11	4.3%
Geological	103	24	23.3%	3	2.9%
Management	297	100	33.7%	39	13.1%
Mechanical	976	94	9.6%	118	12.1%
Mechatronics	636	71	11.2%	65	10.2%
Nanotechnology	482	92	19.1%	37	7.7%
Software	572	81	14.2%	59	10.3%
Systems Design	417	123	29.5%	11	2.6%
TOTAL	6995	1431	20.5%	782	11.2%

2. FTE Undergraduate Enrolment, 2009/10

Program	Total	# Female	% Female	#Int'l	% Int'l
Architecture	276.0	153.3	55.5%	6.5	2.4%
Chemical	472.8	161.8	34.2%	35.8	7.6%
UAE: Chemical	8.0	1.0	12.5%	7.0	87.5%
Civil	383.3	91.9	24.0%	22.0	5.7%
UAE: Civil	13.5	0.0	0.0%	13.5	100.0%
Computer	447.9	43.8	9.8%	29.0	6.5%
Electrical	718.1	69.4	9.7%	48.6	6.8%
Environmental	140.7	71.4	50.7%	6.5	4.6%
Geological	61.9	15.4	24.9%	1.0	1.6%
Management	130.3	37.0	28.4%	13.0	10.0%
Mechanical	678.2	52.9	7.8%	33.1	4.9%
Mechatronics	410.1	29.8	7.3%	30.5	7.4%
Nanotechnology	351.6	69.9	19.9%	13.0	3.7%
Software	351.8	30.8	8.8%	17.5	5.0%
Systems Design	296.5	74.1	25.0%	5.5	1.9%
TOTAL	4740.7	902.5	19.0%	282.5	6.0%

FTE Undergraduate Enrolment, 2010/11

Program	Total	# Female	% Female	#Int'l	% Int'l
Architecture	290.4	160	55.1%	6.5	2.2%
Chemical	471.9	164.8	34.9%	48.2	10.2%
UAE: Chemical	25.0	5.0	20.0%	23.0	92.0%
Civil	410.0	85.4	20.8%	26.1	6.4%
UAE: Civil	19.0	3.0	15.8%	16.0	84.2%
Computer	490.7	46.2	9.4%	31.0	6.3%
Electrical	725.9	71.3	9.8%	52.8	7.3%
Environmental	166.4	79.3	47.7%	9.5	5.7%
Geological	61.6	20.3	33.0%	1.0	1.6%
Management	167.0	50.6	30.3%	18.6	11.1%
Mechanical	668.5	48.5	7.3%	44.3	6.6%
Mechatronics	419.9	30.6	7.3%	31.7	7.5%
Nanotechnology	401.6	75.5	18.8%	26.2	6.5%
Software	392.7	36.8	9.4%	23.6	6.0%
Systems Design	315.9	74.5	23.6%	7.8	2.5%
TOTAL	5026.5	951.8	18.9%	366.3	7.3%

FTE Undergraduate Enrolment, 2011/12

Program	Total	# Female	% Female	#Int'l	% Int'l
Architecture	286.2	163.2	57.0%	5.5	1.9%
Chemical	471.3	158.4	33.6%	51.2	10.9%
UAE: Chemical	47.6	15.0	31.5%	42.1	88.4%
Civil	418.4	102.2	24.4%	31.3	7.5%
UAE: Civil	37.5	7.0	18.7%	29.0	77.3%
Computer	500.8	46.4	9.3%	40.6	8.1%
Electrical	743.6	70.1	9.4%	61.9	8.3%
Environmental	189.1	89.3	47.2%	11.8	6.2%
Geological	71.8	18.7	26.0%	1.0	1.4%
Management	203.4	63.6	31.3%	28.0	13.8%
Mechanical	709.5	64.4	9.1%	56.0	7.9%
Mechatronics	443.4	38.6	8.7%	36.5	8.2%
Nanotechnology	384.9	77.9	20.2%	25.6	6.7%
Software	400.2	43.9	11.0%	28.6	7.1%
Systems Design	320.8	75.5	23.5%	8.1	2.5%
TOTAL	5228.5	1034.2	19.8%	457.2	8.7%

FTE Undergraduate Enrolment, 2012/13

Program	Total	# Female	% Female	#Int'l	% Int'l
Architecture	290.2	165.1	56.9%	5.1	1.8%
Chemical	497.9	165.3	33.2%	67.2	13.5%
UAE: Chemical	45.5	12.0	26.4%	35.5	78.0%
Civil	445.1	110.0	24.7%	50.2	11.3%
UAE: Civil	43.5	5.0	11.5%	33.5	77.0%
Computer	546.9	46.2	8.4%	49.9	9.1%
Electrical	711.9	77.6	10.9%	75.8	10.6%
Environmental	191.6	94.5	49.3%	11.5	6.0%
Geological	76.3	19.0	24.9%	1.5	2.0%
Management	223.2	74.6	33.4%	24.8	11.1%
Mechanical	719.3	72.1	10.0%	75.3	10.5%
Mechatronics	475.8	48.7	10.2%	44.8	9.4%
Nanotechnology	397.9	81.2	20.4%	28.2	7.1%
Software	426.9	52.1	12.2%	29.1	6.8%
Systems Design	327.1	94.2	28.8%	8.6	2.6%
TOTAL	5419.1	1117.6	20.6%	541.0	10.0%

FTE Undergraduate Enrolment, 2013/14

Program	Total	# Female	% Female	#Int'l	% Int'l
Architecture	291.8	163.4	56.0%	7.7	2.6%
Chemical	556.2	175.1	31.5%	98.0	17.6%
Civil	487.5	123.0	25.2%	71.8	14.7%
Computer	572.4	49.7	8.7%	62.5	10.9%
Electrical	678.0	70.0	10.3%	81.0	11.9%
Environmental	196.6	100.7	51.2%	8.5	4.3%
Geological	82.9	21.1	25.5%	2.5	3.0%
Management	237.9	81.6	34.3%	33.3	14.0%
Mechanical	779.1	75.6	9.7%	84.7	10.9%
Mechatronics	500.6	53.0	10.6%	49.1	9.8%
Nanotechnology	393.0	75.5	19.2%	30.8	7.8%
Software	458.9	63.9	13.9%	50.5	11.0%
Systems Design	331.0	97.5	29.5%	8.1	2.4%
TOTAL	5565.9	1150.1	20.7%	588.5	10.6%

3. Undergraduate Degrees Granted, 2009

Program	Total	#Female	% Female	#Int'l	% Int'l
Architecture	64	33	51.6%	0	0.0%
Chemical	84	30	35.7%	3	3.6%
Civil	84	18	21.4%	1	1.2%
Computer	144	10	6.9%	6	4.2%
Electrical	92	9	9.8%	2	2.2%
Environmental	20	7	35.0%	1	5.0%
Geological	13	2	15.4%	1	7.7%
Mechanical	134	17	12.7%	2	1.5%
Mechatronics	88	9	10.2%	5	5.7%
Software	52	3	5.8%	3	5.8%
Systems Design	74	17	23.0%	2	2.7%
TOTAL	849	155	18.3%	26	3.1%

Undergraduate Degrees Granted, 2010

Program	Total	#Female	% Female	#Int'l	% Int'l
Architecture	56	32	57.1%	3	0.0%
Chemical	116	34	29.3%	3	2.6%
Civil	76	20	26.3%	3	3.9%
Computer	95	4	4.2%	2	2.1%
Electrical	117	10	8.5%	5	4.3%
Environmental	23	12	52.2%	0	0.0%
Geological	10	0	0.0%	0	0.0%
Mechanical	149	15	10.1%	7	4.7%
Mechatronics	97	8	8.2%	6	6.2%
Nanotechnology	64	11	17.2%	0	0.0%
Software	62	8	12.9%	0	0.0%
Systems Design	53	12	22.6%	1	1.9%
TOTAL	918	166	18.1%	30	3.3%

Undergraduate Degrees Granted, 2011

Program	Total	#Female	% Female	#Int'l	% Int'l
Architecture	76	40	52.6%	1	0.0%
Chemical	106	42	39.6%	4	3.8%
Civil	92	21	22.8%	4	4.3%
Computer	101	14	13.9%	4	4.0%
Electrical	154	15	9.7%	10	6.5%
Environmental	28	15	53.6%	1	3.6%
Geological	12	5	41.7%	0	0.0%
Mechanical	153	9	5.9%	5	3.3%
Mechatronics	83	5	6.0%	4	4.8%
Nanotechnology	87	18	20.7%	1	1.1%
Software	70	4	5.7%	2	2.9%
Systems Design	64	14	21.9%	1	1.6%
TOTAL	1026	202	19.7%	37	3.6%

Undergraduate Degrees Granted, 2012

Program	Total	#Female	% Female	#Int'l	% Int'l
Architecture	56	33	58.9%	3	5.4%
Chemical	105	34	32.4%	11	10.5%
Civil	92	28	30.4%	0	0.0%
Computer	89	10	11.2%	3	3.4%
Electrical	156	11	7.1%	8	5.1%
Environmental	34	16	47.1%	2	5.9%
Geological	13	3	23.1%	0	0.0%
Management	38	7	18.4%	4	10.5%
Mechanical	158	11	7.0%	6	3.8%
Mechatronics	88	4	4.5%	4	4.5%
Nanotechnology	70	14	20.0%	4	5.7%
Software	80	8	10.0%	5	6.3%
Systems Design	67	10	14.9%	1	1.5%
TOTAL	1046	189	18.1%	51	4.9%

Undergraduate Degrees Granted, 2013

Program	Total	#Female	% Female	#Int'l	% Int'l
Architecture	78	45	57.7%	0	0.0%
Chemical	104	47	45.2%	8	7.7%
Civil	105	23	21.9%	7	6.7%
Computer	118	14	11.9%	5	4.2%
Electrical	203	23	11.3%	11	5.4%
Environmental	40	21	52.5%	3	7.5%
Geological	21	5	23.8%	0	0.0%
Management	42	19	45.2%	4	9.5%
Mechanical	124	13	10.5%	7	5.6%
Mechatronics	96	9	9.4%	6	6.3%
Nanotechnology	87	18	20.7%	4	4.6%
Software	74	7	9.5%	3	4.1%
Systems Design	68	19	27.9%	1	1.5%
TOTAL	1160	263	22.7%	59	5.1%

4. Undergraduate Year One New Admissions, Fall 2009

Program	New Admissions			Total 1A Enrol't			% of total target	% of int'l target
	CPR	Int'l	Total	# Female	% Female	Total		
Architecture	69	1	70	36	48.6%	74	97.2%	10.0%
Chemical	106	11	117	40	32.8%	122	90.0%	73.3%
UAE: Chemical	1	7	8	1	12.5%	8	n/a	n/a
Civil	101	9	110	22	19.6%	112	104.8%	90.0%
UAE: Civil	0	14	14	0	0.0%	14	n/a	n/a
Electrical & Computer	302	36	338	33	9.6%	345	102.4%	120.0%
Environmental	45	4	49	27	52.9%	51	102.1%	133.3%
Geological	16	1	17	5	29.4%	17	100.0%	50.0%
Management	63	8	71	23	31.9%	72	118.3%	160.0%
Mechanical	182	16	198	14	6.9%	204	101.5%	106.7%
Mechatronics	105	16	121	8	6.6%	122	110.0%	160.0%
Nanotechnology	93	4	97	22	22.2%	99	88.2%	40.0%
Software	105	8	113	7	6.1%	114	102.7%	80.0%
Systems Design	80	3	83	30	36.1%	83	92.2%	n/a
TOTAL	1268	138	1406	268	18.6%	1437	102.1%	115.0%

Undergraduate Year One New Admissions, Fall 2010

Program	New Admissions			Total 1A Enrol't			% of total target	% of int'l target
	CPR	Int'l	Total	# Female	% Female	Total		
Architecture	75	1	76	45	57.7%	78	105.6%	16.7%
Chemical	109	18	127	39	30.5%	128	97.7%	120.0%
UAE: Chemical	2	21	23	5	21.7%	23	92.0%	91.3%
Civil	90	12	102	18	17.5%	103	97.1%	120.0%
UAE: Civil	3	8	11	3	27.3%	11	44.0%	34.8%
Electrical & Computer	336	39	375	38	10.0%	380	111.9%	111.4%
Environmental	60	4	64	24	37.5%	64	110.3%	50.0%
Geological	19	0	19	8	36.4%	22	111.8%	0.0%
Management	63	10	73	20	27.0%	74	121.7%	100.0%
Mechanical	177	18	195	15	7.5%	200	97.5%	90.0%
Mechatronics	118	11	129	15	11.4%	132	112.2%	73.3%
Nanotechnology	128	15	143	22	15.3%	144	130.0%	150.0%
Software	118	10	128	16	12.3%	130	116.4%	100.0%
Systems Design	97	5	102	21	20.2%	104	113.3%	100.0%
TOTAL	1395	172	1567	289	18.1%	1593	107.9%	89.6%

Undergraduate Year One New Admissions, Fall 2011

Program	New Admissions			Total 1A Enrol't			% of total target	% of int'l target
	CPR	Int'l	Total	# Female	% Female	Total		
Architecture	72	2	74	45	60.0%	75	102.8%	33.3%
Chemical	120	18	138	47	33.8%	139	98.6%	90.0%
UAE: Chemical	5	28	33	12	35.3%	34	103.1%	93.3%
Civil	98	15	113	38	31.4%	121	98.3%	100.0%
UAE: Civil	8	22	30	7	23.3%	30	166.7%	146.7%
Electrical & Computer	297	44	341	28	8.0%	349	96.1%	110.0%
Environmental	60	5	65	31	46.3%	67	95.6%	62.5%
Geological	18	1	19	5	25.0%	20	111.8%	50.0%
Management	55	11	66	27	39.1%	69	110.0%	110.0%
Mechanical	184	30	214	24	10.7%	225	103.4%	136.4%
Mechatronics	112	21	133	19	14.6%	130	110.8%	140.0%
Nanotechnology	107	9	116	26	22.4%	116	105.5%	90.0%
Software	108	13	121	18	14.6%	123	100.8%	86.7%
Systems Design	86	3	89	23	24.2%	95	101.1%	100.0%
TOTAL	1330	222	1552	350	22.0%	1593	102.0%	105.2%

Undergraduate Year One New Admissions, Fall 2012

Program	New Admissions			Total 1A Enrol't			% of total target	% of int'l target
	CPR	Int'l	Total	# Female	% Female	Total		
Architecture	74	1	75	43	56.6%	76	98.7%	16.7%
Chemical	123	18	141	43	29.3%	147	100.7%	90.0%
UAE: Chemical	7	20	27	6	20.7%	29	67.5%	57.1%
Civil	92	14	106	41	36.0%	114	92.2%	93.3%
UAE: Civil	6	24	30	3	9.7%	31	75.0%	68.6%
Electrical & Computer	301	57	358	41	10.8%	380	99.4%	114.0%
Environmental	54	6	60	37	56.1%	66	85.7%	75.0%
Geological	32	0	32	10	28.6%	35	118.5%	0.0%
Management	58	4	62	24	34.3%	70	95.4%	40.0%
Mechanical	176	34	210	23	10.3%	224	100.0%	136.0%
Mechatronics	115	19	134	22	15.5%	142	103.1%	126.7%
Nanotechnology	108	8	116	31	25.6%	121	100.9%	80.0%
Software	118	11	129	21	15.4%	136	103.2%	73.3%
Systems Design	85	2	87	32	34.4%	93	96.7%	50.0%
TOTAL	1349	218	1567	377	22.7%	1664	97.8%	87.2%

Undergraduate Year One New Admissions, Fall 2013

Program	New Admissions			Total 1A Enrol't			% of total target	% of int'l target
	CPR	Int'l	Total	# Female	% Female	Total		
Architecture	69	5	74	42	55.3%	76	97.4%	83.3%
Chemical	120	23	143	52	34.2%	152	102.1%	115.0%
Civil	120	17	137	46	30.5%	151	109.6%	85.0%
Electrical & Computer	303	61	364	51	12.5%	407	101.1%	110.9%
Environmental	59	2	61	37	50.7%	73	87.1%	25.0%
Geological	21	1	22	6	20.0%	30	78.6%	33.3%
Management	71	8	79	34	38.2%	89	121.5%	80.0%
Mechanical	179	35	214	18	7.5%	241	101.9%	140.0%
Mechatronics	122	19	141	21	14.1%	149	108.5%	126.7%
Nanotechnology	97	8	105	23	21.7%	106	91.3%	80.0%
Software	122	26	148	27	17.9%	151	118.4%	173.3%
Systems Design	93	3	96	34	34.0%	100	106.7%	75.0%
TOTAL	1376	208	1584	391	22.7%	1725	103.3%	108.9%

5. Undergraduate Admissions by Entering Average Grade Range, 2009 – 2013

Department	2009	2010	2011	2012	2013
90-94%	38.1%	37.6%	41.3%	43.7%	48.5%
>=95%	16.4%	14.9%	16.0%	21.9%	25.2%

6. Undergraduate Students:Faculty Ratio, 2009/10 – 2013/14

Department	2009/10	2010/11	2011/12	2012/13	2013/14
Architecture	17.3	18.2	15.9	15.3	14.6
Chemical	19.3	18.0	17.0	18.8	19.9
Civil & Environmental	17.0	18.1	18.7	19.5	20.8
Electrical & Computer	19.9	20.0	20.4	19.7	19.6
Management Sciences	6.4	7.5	7.7	8.2	9.0
Mechanical & Mechatronics	18.1	17.5	18.2	19.0	20.4
Systems Design	17.0	18.8	18.4	18.9	18.5
TOTAL	17.6	17.7	17.6	17.8	18.5

7. Undergraduate Degrees Granted:Faculty Ratio, 2009/10 – 2013/14

Department	2009/10	2010/11	2011/12	2012/13	2013/14
Architecture	4.0	3.5	4.2	2.9	3.9
Chemical	2.7	3.9	3.6	3.6	3.9
Civil & Environmental	3.3	3.0	3.5	3.6	4.5
Electrical & Computer	3.6	3.5	4.1	3.8	4.6
Management Sciences	n/a	n/a	n/a	1.4	1.6
Mechanical & Mechatronics	3.7	3.9	3.8	4.0	3.4
Systems Design	4.1	3.4	3.7	3.8	3.7
TOTAL	3.3	3.3	3.5	3.4	3.9

8. Co-op Employment, 2009

Discipline	Seeking Employment	Employed	Unemployed	% Employed	% Int'l Work Terms
Architecture	331	323	8	97.6%	21.4%
Chemical	697	661	36	94.8%	4.5%
Civil	531	518	13	97.6%	7.5%
Computer	653	643	10	98.5%	11.8%
Electrical	1016	972	44	95.7%	9.6%
Environmental	207	200	7	96.6%	7.5%
Geological	80	78	2	97.5%	0.0%
Management	131	125	6	95.4%	8.0%
Mechanical	927	856	71	92.3%	5.7%
Mechatronics	592	568	24	95.9%	8.6%
Nanotechnology	486	478	8	98.4%	11.1%
Software	491	479	12	97.6%	20.5%
Systems Design	447	439	8	98.2%	12.3%
TOTAL	6589	6340	249	96.2%	10.0%

Co-op Employment, 2010

Discipline	Seeking Employment	Employed	Unemployed	% Employed	% Int'l Work Terms
Architecture	396	362	34	91.4%	27.4%
Chemical	683	649	34	95.0%	7.0%
Civil	599	577	22	96.3%	6.1%
Computer	663	650	13	98.0%	13.4%
Electrical	1085	1040	45	95.9%	8.1%
Environmental	228	214	14	93.9%	10.7%
Geological	80	75	5	93.8%	1.4%
Management	189	171	18	90.5%	9.1%
Mechanical	950	901	49	94.8%	6.8%
Mechatronics	602	595	7	98.8%	11.9%
Nanotechnology	536	512	24	95.5%	16.6%
Software	540	530	10	98.1%	25.3%
Systems Design	429	421	8	98.1%	11.6%
TOTAL	6980	6697	283	96.0%	11.8%

Co-op Employment, 2011

Discipline	Seeking Employment	Employed	Unemployed	% Employed	% Int'l Work Terms
Architecture	367	350	17	95.4%	39.9%
Chemical	673	633	40	94.1%	6.0%
Civil	582	561	21	96.4%	3.0%
Computer	687	680	7	99.0%	13.4%
Electrical	1157	1110	47	95.9%	9.8%
Environmental	272	259	13	95.2%	5.1%
Geological	102	90	12	88.2%	1.1%
Management	281	271	10	96.4%	9.5%
Mechanical	971	945	26	97.3%	7.9%
Mechatronics	647	637	10	98.5%	10.2%
Nanotechnology	536	515	21	96.1%	15.6%
Software	554	550	4	99.3%	30.4%
Systems Design	470	461	9	98.1%	6.8%
TOTAL	7299	7062	237	96.8%	12.1%

Co-op Employment, 2012

Discipline	Seeking Employment	Employed	Unemployed	% Employed	% Int'l Work Terms
Architecture	399	385	14	96.5%	29.8%
Chemical	750	707	43	94.3%	4.6%
Civil	670	650	20	97.0%	5.8%
Computer	745	731	14	98.1%	13.0%
Electrical	1034	990	44	95.7%	12.8%
Environmental	287	274	13	95.5%	4.4%
Geological	97	84	13	86.6%	1.2%
Management	306	289	17	94.4%	9.1%
Mechanical	1032	993	39	96.2%	6.6%
Mechatronics	699	685	14	98.0%	13.0%
Nanotechnology	601	584	17	97.2%	23.9%
Software	590	585	5	99.2%	33.8%
Systems Design	476	463	13	97.3%	14.7%
TOTAL	7686	7420	266	96.5%	14.5%

Co-op Employment, 2013

Discipline	Seeking Employment	Employed	Unemployed	% Employed	% Int'l Work Terms
Architecture	404	387	17	95.8%	31.0%
Chemical	800	764	36	95.5%	8.0%
Civil	694	684	10	98.6%	7.3%
Computer	760	752	8	98.9%	13.3%
Electrical	1024	1003	21	97.9%	9.5%
Environmental	289	268	21	92.7%	3.0%
Geological	125	112	13	89.6%	3.6%
Management	315	308	7	97.8%	11.0%
Mechanical	1099	1068	31	97.2%	8.1%
Mechatronics	744	733	11	98.5%	13.0%
Nanotechnology	564	553	11	98.0%	20.8%
Software	602	597	5	99.2%	36.5%
Systems Design	481	478	3	99.4%	13.6%
TOTAL	7901	7707	194	97.5%	14.6%

9. Co-op Earnings, 2009/10-2013/14 ($ millions)

	2009/10	2010/11	2011/12	2012/13	2013/14
Faculty of Engineering	$71.7 M	$80.6 M	$97.7 M	$100.3 M	$107.8 M

10. Undergraduate Exchange Participation, 2009-2013

	2009	2010	2011	2012	2013
Incoming Students	180	204	205	205	257
Outgoing Students	74	89	96	91	105
TOTAL	254	293	301	296	362

C. Graduate Studies Data Tables

1. Total Graduate Enrolment (Head Count), Fall 2009

Department	PhD	Rsch Master	Prof Master	Non Deg	Total	# Female	% Female	# Int'l	% Int'l
Architecture	n/a	144	n/a	3	147	74	50.3%	7	4.8%
Conrad	n/a	n/a	62	56	118	37	31.4%	73	61.9%
Chemical	84	59	17	0	160	54	33.8%	68	42.5%
Civil & Environmental	89	85	60	3	237	55	23.2%	66	27.8%
Electrical & Computer	264	132	140	4	540	87	16.1%	197	36.5%
Management Sciences	31	33	153	2	219	68	31.1%	49	22.4%
Mechanical & Mechatronics	105	115	69	2	291	44	15.1%	62	21.3%
Systems Design	56	33	11	5	105	23	21.9%	34	32.4%
TOTAL	629	601	512	75	1817	442	24.3%	556	30.6%

Total Graduate Enrolment (Head Count), Fall 2010

Department	PhD	Rsch Master	Prof Master	Non Deg	Total	# Female	% Female	# Int'l	% Int'l
Architecture	n/a	119	n/a	3	122	61	50.0%	6	4.9%
Conrad	n/a	n/a	47	17	64	20	31.3%	33	51.6%
Chemical	90	52	13	0	155	50	32.3%	60	38.7%
Civil & Environmental	85	79	38	2	204	52	25.5%	59	28.9%
Electrical & Computer	296	140	191	2	629	99	15.7%	258	41.0%
Management Sciences	31	32	188	1	252	86	34.1%	94	37.3%
Mechanical & Mechatronics	119	108	73	2	302	50	16.6%	78	25.8%
Systems Design	59	40	12	5	116	23	19.8%	38	32.8%
TOTAL	680	570	562	32	1844	441	23.9%	626	33.9%

Total Graduate Enrolment (Head Count), Fall 2011

Department	PhD	Rsch Master	Prof Master	Non Deg	Total	# Female	% Female	# Int'l	% Int'l
Architecture	n/a	116	n/a	3	119	62	52.1%	8	6.7%
Conrad	n/a	n/a	33	0	33	9	27.3%	16	48.5%
Chemical	106	64	14	0	184	56	30.4%	90	48.9%
Civil & Environmental	108	85	41	0	234	58	24.8%	75	32.1%
Electrical & Computer	297	157	198	4	656	118	18.0%	302	46.0%
Management Sciences	33	31	131	1	196	63	32.1%	49	25.0%
Mechanical & Mechatronics	118	115	57	2	292	51	17.5%	90	30.8%
Systems Design	63	41	9	2	115	27	23.5%	52	45.2%
TOTAL	725	609	483	12	1829	444	24.3%	682	37.3%

Total Graduate Enrolment (Head Count), Fall 2012

Department	PhD	Rsch Master	Prof Master	Non Deg	Total	# Female	% Female	# Int'l	% Int'l
Architecture	n/a	115	n/a	6	121	62	51.2%	10	8.3%
Conrad	n/a	n/a	48	0	48	17	35.4%	21	43.8%
Chemical	113	55	29	5	202	60	29.7%	109	54.0%
Civil & Environmental	117	109	33	1	260	65	25.0%	100	38.5%
Electrical & Computer	288	178	198	5	669	122	18.2%	323	48.3%
Management Sciences	31	21	146	0	198	72	36.4%	72	36.4%
Mechanical & Mechatronics	128	142	49	1	320	45	14.1%	106	33.1%
Systems Design	67	40	17	3	127	26	20.5%	65	51.2%
TOTAL	744	660	520	21	1945	469	24.1%	806	41.4%

Total Graduate Enrolment (Head Count), Fall 2013

Department	PhD	Rsch Master	Prof Master	Non Deg	Total	# Female	% Female	# Int'l	% Int'l
Architecture	n/a	99	n/a	1	100	54	54.0%	10	10.0%
Conrad	n/a	n/a	34	0	34	8	23.5%	12	35.3%
Chemical	119	62	48	0	229	70	30.6%	130	56.8%
Civil & Environmental	117	103	24	0	244	63	25.8%	100	41.0%
Electrical & Computer	262	156	182	2	602	105	17.4%	302	50.2%
Management Sciences	27	23	133	3	186	67	36.0%	80	43.0%
Mechanical & Mechatronics	140	127	50	2	319	51	16.0%	114	35.7%
Systems Design	73	41	18	4	136	28	20.6%	76	55.9%
TOTAL	738	611	489	12	1850	446	24.1%	824	44.5%

2. FTE Graduate Enrolment, 2009/10

Department	PhD	Rsch Master	Prof Master	Total	# Female	% Female	# Int'l	% Int'l
Architecture	n/a	120.7	n/a	120.7	62.1	51.4%	3.1	2.6%
Conrad	n/a	n/a	50.7	50.7	14.9	29.3%	16.7	32.9%
Chemical	79.6	59.3	13.5	152.4	53.3	35.0%	65.7	43.1%
Civil & Environmental	80.3	74.7	46.2	201.2	45.3	22.5%	61.4	30.5%
Electrical & Computer	254.7	108.9	81.2	444.8	72.7	16.3%	187.3	42.1%
Management Sciences	26.3	30.7	76.4	133.4	47.2	35.4%	40.3	30.2%
Mechanical & Mechatronics	95.6	101.5	44.0	241.1	35.6	14.8%	58.0	24.1%
Systems Design	55.3	30.3	8.0	93.6	20.6	22.0%	28.0	29.9%
TOTAL	591.8	526.1	320.0	1438.1	351.7	24.5%	460.5	32.0%

FTE Graduate Enrolment, 2010/11

Department	PhD	Rsch Master	Prof Master	Total	# Female	% Female	# Int'l	% Int'l
Architecture	n/a	106.8	n/a	106.8	52.1	48.8%	4.0	3.7%
Conrad	n/a	n/a	45.6	45.6	12.3	27.0%	16.7	36.6%
Chemical	92.4	49.3	12.1	153.9	51.4	33.4%	65.7	42.7%
Civil & Environmental	83.1	69.3	24.5	176.8	46.4	26.2%	58.7	33.2%
Electrical & Computer	280.1	116.2	111.2	507.6	84.3	16.6%	231.5	45.6%
Management Sciences	26.0	29.1	117.1	172.3	60.4	35.1%	80.2	46.5%
Mechanical & Mechatronics	107.1	95.4	42.8	245.3	42.9	17.5%	72.3	29.5%
Systems Design	59.3	32.1	10.1	101.4	20.0	19.7%	32.6	32.1%
TOTAL	648.0	498.2	363.4	1509.7	369.8	24.5%	561.7	37.2%

FTE Graduate Enrolment, 2011/12

Department	PhD	Rsch Master	Prof Master	Total	# Female	% Female	# Int'l	% Int'l
Architecture	n/a	96.1	n/a	96.1	51.4	53.5%	3.6	3.7%
Conrad	n/a	n/a	34.8	34.8	10.5	30.2%	15.3	44.0%
Chemical	101.6	54.2	15.1	170.9	54.7	32.0%	85.0	49.7%
Civil & Environmental	98.6	76.2	22.4	197.2	52.7	26.7%	75.6	38.3%
Electrical & Computer	283.2	139.8	124.4	547.3	100.0	18.3%	289.4	52.9%
Management Sciences	25.4	27.0	73.6	126.0	42.6	33.8%	48.7	38.7%
Mechanical & Mechatronics	107.7	100.9	30.2	238.8	42.5	17.8%	83.9	35.1%
Systems Design	59.8	32.4	8.7	100.9	24.2	24.0%	46.3	45.9%
TOTAL	676.3	526.6	309.2	1512.0	378.6	25.0%	647.8	42.8%

FTE Graduate Enrolment, 2012/13

Department	PhD	Rsch Master	Prof Master	Total	# Female	% Female	# Int'l	% Int'l
Architecture	n/a	94.7	n/a	94.7	50.0	52.8%	3.4	3.6%
Conrad	n/a	n/a	41.3	41.3	13.3	32.2%	18.7	45.3%
Chemical	109.0	48.7	26.4	184.1	58.1	31.6%	103.8	56.4%
Civil & Environmental	111.3	83.9	21.2	216.3	56.3	26.0%	94.6	43.7%
Electrical & Computer	279.8	156.8	124.1	560.7	105.1	18.7%	317.3	56.6%
Management Sciences	22.7	20.8	72.3	115.8	39.7	34.3%	56.2	48.5%
Mechanical & Mechatronics	116.5	123.9	31.8	272.2	41.6	15.3%	99.3	36.5%
Systems Design	64.1	33.1	14.9	112.1	23.9	21.3%	60.4	53.9%
TOTAL	703.4	561.9	332.0	1597.2	388.0	24.3%	753.7	47.2%

FTE Graduate Enrolment, 2013/14

Department	PhD	Rsch Master	Prof Master	Total	# Female	% Female	# Int'l	% Int'l
Architecture	n/a	79.9	n/a	86.4	43.7	54.6%	5.7	7.2%
Conrad	n/a	n/a	37.8	37.8	10.4	27.6%	14.7	38.8%
Chemical	106.1	54.1	41.4	201.6	61.2	30.3%	124.2	61.6%
Civil & Environmental	111.2	79.4	14.1	204.6	52.4	25.6%	92.5	45.2%
Electrical & Computer	256.2	145.8	111.7	515.6	93.1	18.1%	308.8	60.1%
Management Sciences	21.2	18.9	65.6	107.4	39.7	37.6%	61.4	58.1%
Mechanical & Mechatronics	124.7	116.6	27.1	270.6	44.0	16.4%	109.7	40.9%
Systems Design	67.3	33.6	15.4	118.9	23.4	20.1%	67.1	57.7%
TOTAL	686.6	528.3	313.0	1542.9	367.8	24.1%	784.1	51.3%

3. Graduate Degrees Granted, 2009

Department	PhD	Rsch Master	Prof Master	Total	# Female	% Female	# Int'l	% Int'l
Architecture	n/a	32	n/a	32	23	71.9%	0	0.0%
Conrad	n/a	n/a	42	42	24	57.1%	16	38.1%
Chemical	13	28	0	41	13	31.7%	10	24.4%
Civil & Environmental	12	27	28	67	8	11.9%	7	10.4%
Electrical & Computer	36	46	39	121	19	15.7%	28	23.1%
Management Sciences	8	12	45	65	20	30.8%	17	26.2%
Mechanical & Mechatronics	17	29	14	60	10	16.7%	3	5.0%
Systems Design	10	9	1	20	6	30.0%	4	20.0%
TOTAL	96	183	169	448	123	27.5%	85	19.0%

Graduate Degrees Granted, 2010

Department	PhD	Rsch Master	Prof Master	Total	# Female	% Female	# Int'l	% Int'l
Architecture	n/a	49	n/a	49	24	49.0%	1	2.0%
Conrad	n/a	n/a	52	52	13	25.0%	17	32.7%
Chemical	12	25	10	47	15	31.9%	14	29.8%
Civil & Environmental	18	31	33	82	15	18.3%	11	13.4%
Electrical & Computer	37	61	49	147	28	19.0%	39	26.5%
Management Sciences	6	15	50	71	23	32.4%	17	23.9%
Mechanical & Mechatronics	10	46	43	99	11	11.1%	7	7.1%
Systems Design	11	11	4	26	4	15.4%	4	15.4%
TOTAL	94	238	241	573	133	23.2%	110	19.2%

Graduate Degrees Granted, 2011

Department	PhD	Rsch Master	Prof Master	Total	# Female	% Female	# Int'l	% Int'l
Architecture	n/a	44	n/a	44	27	61.4%	1	2.3%
Conrad	n/a	n/a	43	43	12	27.9%	16	37.2%
Chemical	20	25	7	52	14	26.9%	19	36.5%
Civil & Environmental	8	27	24	59	14	23.7%	10	16.9%
Electrical & Computer	50	44	82	176	29	16.5%	37	21.0%
Management Sciences	7	17	85	109	40	36.7%	45	41.3%
Mechanical & Mechatronics	20	44	36	100	11	11.0%	13	13.0%
Systems Design	11	10	8	29	5	17.2%	8	27.6%
TOTAL	116	211	285	612	152	24.8%	149	24.3%

Graduate Degrees Granted, 2012

Department	PhD	Rsch Master	Prof Master	Total	# Female	% Female	# Int'l	% Int'l
Architecture	n/a	39	n/a	39	20	51.3%	2	5.1%
Conrad	n/a	n/a	30	30	7	23.3%	13	43.3%
Chemical	17	26	5	48	20	41.7%	17	35.4%
Civil & Environmental	14	23	14	51	15	29.4%	8	15.7%
Electrical & Computer	53	55	104	212	39	18.4%	85	40.1%
Management Sciences	6	18	56	80	25	31.3%	25	31.3%
Mechanical & Mechatronics	14	29	32	75	14	18.7%	10	13.3%
Systems Design	11	19	4	34	14	41.2%	11	32.4%
TOTAL	115	209	245	569	154	27.1%	171	30.1%

Graduate Degrees Granted, 2013

Department	PhD	Rsch Master	Prof Master	Total	# Female	% Female	# Int'l	% Int'l
Architecture	n/a	42	n/a	42	26	61.9%	2	4.8%
Conrad	n/a	n/a	50	50	18	36.0%	22	44.0%
Chemical	17	24	20	61	14	23.0%	26	42.6%
Civil & Environmental	24	29	20	73	16	21.9%	19	26.0%
Electrical & Computer	59	88	100	247	50	20.2%	118	47.8%
Management Sciences	6	10	60	76	32	42.1%	23	30.3%
Mechanical & Mechatronics	19	56	28	103	12	11.7%	24	23.3%
Systems Design	9	10	7	26	3	11.5%	9	34.6%
TOTAL	134	259	285	678	171	25.2%	243	35.8%

4. FTE Graduate Student Admissions, 2010

Department	Degree Type	CPR	Int'l	Total
Architecture	PhD	n/a	n/a	n/a
	Research Master	31.0	2.0	33.0
	Professional Master	n/a	n/a	n/a
	Total	31.0	2.0	33.0
Conrad	PhD	n/a	n/a	n/a
	Research Master	n/a	n/a	n/a
	Professional Master	22.0	18.0	40.0
	Total	22.0	18.0	40.0
Chemical	PhD	5.3	12.0	17.3
	Research Master	16.0	5.0	21.0
	Professional Master	7.0	1.0	8.0
	Total	28.3	18.0	46.3
Civil & Environmental	PhD	6.0	11.0	17.0
	Research Master	21.5	8.3	29.8
	Professional Master	10.9	0.0	10.9
	Total	38.4	19.3	57.7
Electrical & Computer	PhD	19.2	62.0	81.2
	Research Master	25.5	43.3	68.8
	Professional Master	48.5	33.6	82.1
	Total	93.2	138.9	232.1
Management Sciences	PhD	2.6	2.0	4.6
	Research Master	1.3	2.0	3.3
	Professional Master	28.2	19.3	47.5
	Total	32.1	23.3	55.4
Mechanical & Mechatronics	PhD	11.6	16.3	27.9
	Research Master	27.6	10.0	37.6
	Professional Master	31.2	1.0	32.2
	Total	70.4	27.3	97.7
Systems Design	PhD	8.3	7.0	15.3
	Research Master	6.3	6.3	12.6
	Professional Master	5.3	1.0	6.3
	Total	19.9	14.3	34.2
TOTAL	PhD	53.0	110.3	163.3
	Research Master	129.2	76.9	206.1
	Professional Master	153.1	73.9	227.0
	TOTAL	335.3	261.1	596.4

FTE Graduate Student Admissions, 2011

Department	Degree Type	CPR	Int'l	Total
Architecture	PhD	n/a	n/a	n/a
	Research Master	39.0	1.0	40.0
	Professional Master	n/a	n/a	n/a
	Total	39.0	1.0	40.0
Conrad	PhD	n/a	n/a	n/a
	Research Master	n/a	n/a	n/a
	Professional Master	14.0	17.0	31.0
	Total	14.0	17.0	31.0
Chemical	PhD	6.3	23.0	29.3
	Research Master	19.3	12.0	31.3
	Professional Master	4.3	9.0	13.3
	Total	29.9	44.0	73.9
Civil & Environmental	PhD	5.3	18.0	23.3
	Research Master	27.2	11.0	38.2
	Professional Master	19.0	0.0	19.0
	Total	51.5	29.0	80.5
Electrical & Computer	PhD	19.6	37.0	56.6
	Research Master	24.2	35.3	59.5
	Professional Master	35.3	43.0	78.3
	Total	79.1	115.3	194.4
Management Sciences	PhD	1.9	5.0	6.9
	Research Master	4.6	0.0	4.6
	Professional Master	23.0	17.3	40.3
	Total	29.5	22.3	51.8
Mechanical & Mechatronics	PhD	7.3	18.0	25.3
	Research Master	35.5	14.0	49.5
	Professional Master	16.6	2.0	18.6
	Total	59.4	34.0	93.4
Systems Design	PhD	3.3	9.0	12.3
	Research Master	7.3	7.0	14.3
	Professional Master	1.3	6.0	7.3
	Total	11.9	22.0	33.9
TOTAL	PhD	43.7	110.0	153.7
	Research Master	157.1	80.3	237.4
	Professional Master	113.5	94.3	207.8
	TOTAL	314.3	284.6	598.9

FTE Graduate Student Admissions, 2012

Department	Degree Type	CPR	Int'l	Total
	PhD	n/a	n/a	n/a
	Research Master	45.0	1.0	46.0
Architecture	Professional Master	n/a	n/a	n/a
	Course-Based Master	n/a	n/a	n/a
	Total	45.0	1.0	46.0
	PhD	n/a	n/a	n/a
	Research Master	n/a	n/a	n/a
Conrad	Professional Master	n/a	n/a	n/a
	Course-Based Master	25.0	16.0	41.0
	Total	25.0	16.0	41.0
	PhD	1.3	17.0	18.3
	Research Master	10.3	11.0	21.3
Chemical	Professional Master	10.6	14.0	24.6
	Course-Based Master	n/a	n/a	n/a
	Total	22.2	42.0	64.2
	PhD	4.3	21.0	25.3
	Research Master	24.1	7.3	31.4
Civil & Environmental	Professional Master	9.5	1.0	10.5
	Course-Based Master	n/a	n/a	n/a
	Total	37.9	29.3	67.2
	PhD	13.6	35.0	48.6
	Research Master	33.8	34.3	68.1
Electrical & Computer	Professional Master	25.2	49.2	74.4
	Course-Based Master	9.9	0.3	10.2
	Total	82.5	118.8	201.3
	PhD	1.9	4.0	5.9
	Research Master	1.0	6.0	7.0
Management Sciences	Professional Master	13.2	38.3	51.5
	Course-Based Master	8.4	0.0	8.4
	Total	24.5	48.3	72.8
	PhD	5.6	25.0	30.6
	Research Master	44.2	16.0	60.2
Mechanical & Mechatronics	Professional Master	17.6	2.0	19.6
	Course-Based Master	n/a	n/a	n/a
	Total	67.4	43.0	110.4
	PhD	6.9	9.0	15.9
	Research Master	7.0	7.0	14.0
Systems Design	Professional Master	4.0	12.0	16.0
	Course-Based Master	n/a	n/a	n/a
	Total	17.9	28.0	45.9
	PhD	33.6	111.0	144.6
	Research Master	165.4	82.6	248.0
TOTAL	Professional Master	80.1	116.5	196.6
	Course-Based Master	43.3	16.3	59.6
	TOTAL	322.4	326.4	648.8

FTE Graduate Student Admissions, 2013

Department	Degree Type	CPR	Int'l	Total
Architecture	PhD	n/a	n/a	n/a
	Research Master	28.0	7.0	35.0
	Professional Master	n/a	n/a	n/a
	Course-Based Master	n/a	n/a	n/a
	Total	28.0	7.0	35.0
Conrad	PhD	n/a	n/a	n/a
	Research Master	n/a	n/a	n/a
	Professional Master	n/a	n/a	n/a
	Course-Based Master	22.0	12.0	34.0
	Total	22.0	12.0	34.0
Chemical	PhD	7.2	13.0	20.2
	Research Master	13.9	14.0	27.9
	Professional Master	11.6	39.0	50.6
	Course-Based Master	n/a	n/a	n/a
	Total	32.7	66.0	98.7
Civil & Environmental	PhD	8.0	13.0	21.0
	Research Master	17.3	14.0	31.3
	Professional Master	7.9	0.0	7.9
	Course-Based Master	n/a	n/a	n/a
	Total	33.2	27.0	60.2
Electrical & Computer	PhD	13.2	28.0	41.2
	Research Master	24.9	33.0	57.9
	Professional Master	14.4	58.3	72.7
	Course-Based Master	9.3	0.0	9.3
	Total	61.8	119.3	181.1
Management Sciences	PhD	3.0	2.0	5.0
	Research Master	1.0	3.0	4.0
	Professional Master	17.8	29.0	46.8
	Course-Based Master	6.6	0.3	6.9
	Total	28.4	34.3	62.7
Mechanical & Mechatronics	PhD	9.2	21.0	30.2
	Research Master	25.3	13.3	38.6
	Professional Master	27.9	0.0	27.9
	Course-Based Master	n/a	n/a	n/a
	Total	62.4	34.3	96.7
Systems Design	PhD	2.0	11.0	13.0
	Research Master	6.6	4.0	10.6
	Professional Master	1.3	14.3	15.6
	Course-Based Master	n/a	n/a	n/a
	Total	9.9	29.3	39.2
TOTAL	PhD	42.6	88.0	130.6
	Research Master	117.0	88.3	205.3
	Professional Master	80.9	140.6	221.5
	Course-Based Master	37.9	12.3	50.2
	TOTAL	278.4	329.2	607.6

5. Graduate Students:Faculty Ratio, 2009/10

Department	PhD	Rsch Master	Prof Master	Non Deg	All Students	Rsch Students
Architecture	n/a	8.0	n/a	0.4	8.5	8.0
Conrad	n/a	n/a	50.7	54.3	105.0	n/a
Chemical	2.6	1.9	0.4	0.0	4.9	4.5
Civil & Environmental	2.4	2.3	1.4	0.1	6.1	4.7
Electrical & Computer	3.5	1.5	1.1	0.0	6.1	5.0
Management Sciences	1.4	1.6	4.0	0.1	7.0	3.0
Mechanical & Mechatronics	1.9	2.0	0.9	0.0	4.9	3.9
Systems Design	2.4	1.3	0.3	0.1	4.1	3.7
TOTAL	2.4	2.1	1.3	0.3	6.1	4.5

Graduate Students:Faculty Ratio, 2010/11

Department	PhD	Rsch Master	Prof Master	Non Deg	All Students	Rsch Students
Architecture	n/a	7.1	n/a	0.5	7.6	7.1
Conrad	n/a	n/a	22.8	12.0	34.8	n/a
Chemical	2.8	1.5	0.4	0.0	4.7	4.3
Civil & Environmental	2.4	2.0	0.7	0.0	5.2	4.5
Electrical & Computer	3.6	1.5	1.4	0.0	6.6	5.1
Management Sciences	1.3	1.4	5.8	0.0	8.6	2.7
Mechanical & Mechatronics	2.1	1.9	0.8	0.0	4.8	4.0
Systems Design	2.8	1.5	0.5	0.1	4.9	4.3
TOTAL	2.6	2.0	1.4	0.2	6.1	4.5

Graduate Students:Faculty Ratio, 2011/12

Department	PhD	Rsch Master	Prof Master	Non Deg	All Students	Rsch Students
Architecture	n/a	6.0	n/a	0.3	6.3	6.0
Conrad	n/a	n/a	11.6	1.7	13.3	n/a
Chemical	3.0	1.6	0.4	0.0	5.1	4.6
Civil & Environmental	2.7	2.1	0.6	0.0	5.4	4.8
Electrical & Computer	3.7	1.8	1.6	0.0	7.1	5.5
Management Sciences	1.0	1.1	3.0	0.0	5.2	2.2
Mechanical & Mechatronics	2.1	1.9	0.6	0.0	4.6	4.0
Systems Design	2.7	1.5	0.4	0.0	4.6	4.1
TOTAL	2.6	2.0	1.2	0.1	5.8	4.5

Graduate Students:Faculty Ratio, 2012/13

Department	PhD	Rsch Master	Prof Master	Non Deg	All Students	Rsch Students
Architecture	n/a	5.6	n/a	0.4	5.9	5.6
Conrad	n/a	n/a	10.3	0.0	10.3	n/a
Chemical	3.3	1.5	0.8	0.1	5.7	4.8
Civil & Environmental	3.0	2.3	0.6	0.0	5.9	5.3
Electrical & Computer	3.4	1.9	1.5	0.0	6.9	5.3
Management Sciences	1.0	0.9	3.1	0.0	5.0	1.9
Mechanical & Mechatronics	2.3	2.4	0.6	0.0	5.3	4.7
Systems Design	2.9	1.5	0.7	0.1	5.1	4.4
TOTAL	2.6	2.1	1.2	0.1	6.0	4.7

Graduate Students:Faculty Ratio, 2013/14

Department	PhD	Rsch Master	Prof Master	Non Deg	All Students	Rsch Students
Architecture	n/a	4.4	n/a	0.4	4.8	4.4
Conrad	n/a	n/a	9.4	0.0	0.0	9.4
Chemical	3.4	1.7	1.3	0.0	6.4	5.1
Civil & Environmental	3.2	2.3	0.4	0.0	5.9	5.5
Electrical & Computer	3.1	1.8	1.3	0.0	6.2	4.8
Management Sciences	0.9	0.8	2.8	0.1	4.6	1.7
Mechanical & Mechatronics	2.5	2.3	0.5	0.0	5.4	4.8
Systems Design	2.9	1.4	0.7	0.1	5.1	4.3
TOTAL	2.6	2.0	1.2	0.1	5.7	4.5

6. Graduate Degrees Granted:Faculty Ratio, 2009/10

Department	PhD	Rsch Master	Prof Master	All Students	Rsch Students
Architecture	n/a	2.1	n/a	2.1	2.1
Conrad	n/a	n/a	42.0	42.0	n/a
Chemical	0.4	0.9	0.0	1.3	1.3
Civil & Environmental	0.4	0.8	0.8	2.0	1.2
Electrical & Computer	0.5	0.6	0.5	1.7	1.1
Management Sciences	0.4	0.6	2.3	3.4	1.0
Mechanical & Mechatronics	0.3	0.6	0.3	1.2	0.9
Systems Design	0.4	0.4	0.0	0.9	0.8
TOTAL	0.4	0.7	0.7	1.8	1.1

Graduate Degrees Granted:Faculty Ratio, 2010/11

Department	PhD	Rsch Master	Prof Master	All Students	Rsch Students
Architecture	n/a	3.3	0.0	3.3	3.3
Conrad	n/a	n/a	26.0	26.0	n/a
Chemical	0.4	0.8	0.3	1.4	1.1
Civil & Environmental	0.5	0.9	1.0	2.4	1.4
Electrical & Computer	0.5	0.8	0.6	1.9	1.3
Management Sciences	0.3	0.7	2.5	3.5	1.0
Mechanical & Mechatronics	0.2	0.9	0.8	1.9	1.1
Systems Design	0.5	0.5	0.2	1.2	1.0
TOTAL	0.4	0.9	0.9	2.3	1.3

Graduate Degrees Granted:Faculty Ratio, 2011/12

Department	PhD	Rsch Master	Prof Master	All Students	Rsch Students
Architecture	n/a	2.8	n/a	2.8	2.8
Conrad	n/a	n/a	14.3	14.3	n/a
Chemical	0.6	0.7	0.2	1.5	1.3
Civil & Environmental	0.2	0.7	0.7	1.6	1.0
Electrical & Computer	0.6	0.6	1.1	2.3	1.2
Management Sciences	0.3	0.7	3.5	4.5	1.0
Mechanical & Mechatronics	0.4	0.8	0.7	1.9	1.2
Systems Design	0.5	0.4	0.4	1.3	0.9
TOTAL	0.4	0.8	1.1	2.3	1.2

Graduate Degrees Granted:Faculty Ratio, 2012/13

Department	PhD	Rsch Master	Prof Master	All Students	Rsch Students
Architecture	n/a	2.3	n/a	2.3	2.3
Conrad	n/a	n/a	7.5	7.5	n/a
Chemical	0.5	0.8	0.2	1.5	1.3
Civil & Environmental	0.4	0.6	0.4	1.4	1.0
Electrical & Computer	0.6	0.7	1.3	2.6	1.3
Management Sciences	0.3	0.8	2.4	3.4	1.0
Mechanical & Mechatronics	0.3	0.6	0.6	1.5	0.8
Systems Design	0.5	0.9	0.2	1.5	1.3
TOTAL	0.4	0.8	0.9	2.1	1.2

Graduate Degrees Granted:Faculty Ratio, 2013/14

Department	PhD	Rsch Master	Prof Master	All Students	Rsch Students
Architecture	n/a	2.3	n/a	2.3	2.3
Conrad	n/a	n/a	12.5	12.5	n/a
Chemical	0.5	0.8	0.6	1.9	1.3
Civil & Environmental	0.7	0.8	0.6	2.1	1.5
Electrical & Computer	0.7	1.1	1.2	3.0	1.8
Management Sciences	0.3	0.4	2.6	3.3	0.7
Mechanical & Mechatronics	0.4	1.1	0.6	2.0	1.5
Systems Design	0.4	0.4	0.3	1.1	0.8
TOTAL	0.5	1.0	1.1	2.5	1.5

7. Graduate Proportion of Total FTE Enrolment, 2009/10-2013/14

Department	2009/10	2010/11	2011/12	2012/13	2013/14
Architecture	30.4%	26.9%	25.1%	24.6%	21.5%
Conrad	100.0%	100.0%	100.0%	100.0%	100.0%
Chemical	18.8%	18.1%	19.4%	19.9%	21.1%
Civil & Environmental	25.1%	21.2%	21.6%	22.2%	21.1%
Electrical & Computer	20.0%	21.1%	22.1%	22.1%	20.4%
Management Sciences	50.6%	50.8%	38.3%	34.2%	30.8%
Mechanical & Mechatronics	20.7%	21.0%	19.7%	21.3%	19.9%
Systems Design	19.8%	20.2%	19.8%	21.0%	21.2%
TOTAL	23.3%	23.1%	22.4%	22.8%	21.5%

8. Graduate Student Financial Support, 2009/10

Research Master's Students	Total Income	% of FTEs Supported	Avg $ Supported FTEs	% FTEs with GRS	% FTEs with TA	% FTEs with Ext Schlp
Architecture	815,371	50.2%	13,643	0.0%	16.5%	6.5%
Chemical	1,270,595	91.1%	24,388	73.5%	27.6%	14.0%
Civil & Environmental	1,678,710	92.8%	24,282	71.6%	24.2%	19.6%
Electrical & Computer	2,817,825	91.5%	28,744	67.8%	34.5%	29.0%
Management Sciences	511,488	91.6%	20,137	42.1%	54.3%	9.7%
Mechanical & Mechatronics	2,263,415	94.7%	23,985	77.2%	28.2%	24.4%
Systems Design	689,076	93.9%	24,320	54.1%	27.6%	36.5%
TOTAL	10,046,481	82.9%	23,521	52.9%	27.5%	19.3%

Doctoral Students	Total Income	% of FTEs Supported	Avg $ Supported FTEs	% FTEs with GRS	% FTEs with TA	% FTEs with Ext Schlp
Chemical	2,636,063	96.0%	34,838	61.3%	35.1%	31.3%
Civil & Environmental	2,423,345	93.5%	32,719	69.4%	25.2%	27.3%
Electrical & Computer	8,029,297	95.9%	33,363	74.4%	35.3%	24.7%
Management Sciences	782,292	83.9%	36,330	41.6%	26.0%	40.5%
Mechanical & Mechatronics	3,009,167	94.4%	34,040	75.5%	32.1%	27.8%
Systems Design	1,786,981	97.6%	33,318	67.9%	35.7%	29.1%
TOTAL	18,667,144	95.0%	33,697	70.1%	33.0%	27.5%

Graduate Student Financial Support, 2010/11

Research Master's Students	Total Income	% of FTEs Supported	Avg $ Supported FTEs	% FTEs with GRS	% FTEs with TA	% FTEs with Ext Schlp
Architecture	686,942	49.7%	13,434	0.0%	17.8%	7.8%
Chemical	1,002,248	87.4%	23,751	74.6%	29.2%	12.2%
Civil & Environmental	1,645,759	90.4%	26,530	66.3%	34.1%	33.1%
Electrical & Computer	2,997,804	93.0%	28,236	74.0%	35.4%	24.8%
Management Sciences	514,403	83.1%	21,735	41.0%	46.8%	17.9%
Mechanical & Mechatronics	2,116,708	93.6%	24,035	78.1%	30.1%	18.4%
Systems Design	702,033	88.5%	25,072	67.4%	29.5%	19.9%
TOTAL	9,665,896	82.2%	24,088	55.8%	30.2%	19.2%

Doctoral Students	Total Income	% of FTEs Supported	Avg $ Supported FTEs	% FTEs with GRS	% FTEs with TA	% FTEs with Ext Schlp
Chemical	2,904,779	93.6%	34,871	66.7%	33.4%	32.8%
Civil & Environmental	2,588,636	94.5%	33,445	71.2%	36.6%	30.8%
Electrical & Computer	9,170,810	96.2%	35,110	77.8%	39.8%	25.1%
Management Sciences	873,167	82.9%	40,994	46.8%	27.2%	40.5%
Mechanical & Mechatronics	3,303,225	95.3%	32,901	77.6%	32.4%	25.5%
Systems Design	1,770,248	94.7%	33,027	69.1%	35.5%	35.3%
TOTAL	20,610,865	94.8%	34,513	73.3%	36.3%	28.5%

Graduate Student Financial Support, 2011/12

Research Master's Students	Total Income	% of FTEs Supported	Avg $ Supported FTEs	% FTEs with GRS	% FTEs with TA	% FTEs with Ext Schlp
Architecture	$523,669	48.9%	$11,376	0.0%	20.2%	7.1%
Chemical	$1,234,989	94.6%	$24,279	76.6%	27.3%	19.8%
Civil & Environmental	$1,577,429	90.0%	$23,474	69.6%	22.9%	24.5%
Electrical & Computer	$3,714,912	95.0%	$28,872	73.4%	31.2%	24.8%
Management Sciences	$522,318	86.4%	$22,677	39.1%	55.6%	13.2%
Mechanical & Mechatronics	$2,411,208	92.7%	$25,927	73.1%	29.6%	24.6%
Systems Design	$715,388	89.3%	$25,550	56.3%	36.1%	20.2%
TOTAL	$10,699,913	84.6%	$24,496	56.9%	28.8%	20.1%

Doctoral Students	Total Income	% of FTEs Supported	Avg $ Supported FTEs	% FTEs with GRS	% FTEs with TA	% FTEs with Ext Schlp
Chemical	$3,084,290	96.7%	$32,604	73.1%	29.6%	31.0%
Civil & Environmental	$3,133,512	95.1%	$33,791	74.0%	35.9%	31.5%
Electrical & Computer	$9,390,829	96.6%	$35,242	80.0%	38.6%	25.5%
Management Sciences	$788,720	81.7%	$38,226	49.2%	33.0%	35.6%
Mechanical & Mechatronics	$3,369,462	94.3%	$33,695	83.1%	31.2%	28.3%
Systems Design	$1,964,717	95.2%	$35,316	64.4%	35.9%	38.8%
TOTAL	$21,731,531	95.3%	$34,491	76.0%	35.2%	29.2%

Graduate Student Financial Support, 2012/13

Research Master's Students	Total Income	% of FTEs Supported	Avg $ Supported FTEs	% FTEs with GRS	% FTEs with TA	% FTEs with Ext Schlp
Architecture	$521,413	47.5%	$12,240	0.0%	18.9%	7.8%
Chemical	$1,164,423	94.3%	$25,838	72.1%	26.4%	20.9%
Civil & Environmental	$1,691,218	86.6%	$23,435	65.5%	21.3%	25.0%
Electrical & Computer	$4,137,061	96.0%	$28,105	77.9%	31.2%	20.4%
Management Sciences	$471,898	93.2%	$25,280	59.9%	61.6%	6.7%
Mechanical & Mechatronics	$3,003,730	93.8%	$26,014	74.0%	25.3%	27.9%
Systems Design	$767,018	88.5%	$27,296	60.1%	30.4%	28.3%
TOTAL	$11,756,761	85.5%	$25,054	60.2%	27.0%	20.7%

Doctoral Students	Total Income	% of FTEs Supported	Avg $ Supported FTEs	% FTEs with GRS	% FTEs with TA	% FTEs with Ext Schlp
Chemical	$3,417,360	95.6%	$34,015	67.2%	27.0%	37.6%
Civil & Environmental	$3,560,164	95.5%	$34,733	75.5%	30.4%	30.4%
Electrical & Computer	$9,431,538	97.6%	$35,470	80.6%	38.1%	23.7%
Management Sciences	$719,760	81.2%	$39,331	53.3%	41.9%	28.1%
Mechanical & Mechatronics	$3,581,829	95.9%	$33,350	80.4%	30.7%	20.8%
Systems Design	$2,148,012	95.0%	$36,572	63.1%	37.4%	39.1%
TOTAL	$22,858,663	95.9%	$34,990	75.2%	34.0%	28.0%

Graduate Student Financial Support, 2013/14

Research Master's Students	Total Income	% of FTEs Supported	Avg $ Supported FTEs	% FTEs with GRS	% FTEs with TA	% FTEs with Ext Schlp
Architecture	$507,363	54.5%	$11,637	0.0%	23.2%	4.3%
Chemical	$1,391,969	94.8%	$27,116	74.5%	28.3%	24.0%
Civil & Environmental	$1,717,160	87.4%	$24,767	71.9%	23.9%	19.6%
Electrical & Computer	$4,043,007	96.5%	$28,749	75.5%	34.3%	23.6%
Management Sciences	$519,919	96.1%	$28,619	77.6%	64.6%	3.5%
Mechanical & Mechatronics	$2,969,965	96.2%	$26,462	75.7%	22.9%	28.0%
Systems Design	$778,723	89.4%	$25,957	66.5%	29.8%	27.8%
TOTAL	$11,928,106	88.1%	$25,635	63.0%	28.7%	20.6%

Doctoral Students	Total Income	% of FTEs Supported	Avg $ Supported FTEs	% FTEs with GRS	% FTEs with TA	% FTEs with Ext Schlp
Chemical	$3,600,777	96.0%	$35,348	67.9%	25.7%	37.7%
Civil & Environmental	$3,833,220	97.4%	$35,405	76.6%	29.2%	32.7%
Electrical & Computer	$8,965,944	97.7%	$35,807	78.6%	36.5%	24.5%
Management Sciences	$776,021	90.9%	$40,278	66.0%	50.2%	39.3%
Mechanical & Mechatronics	$4,181,267	94.4%	$35,515	81.5%	34.5%	24.0%
Systems Design	$2,281,932	94.2%	$36,012	68.7%	33.8%	34.6%
TOTAL	$23,639,160	96.3%	$35,768	75.8%	33.4%	29.2%

D. Research Data Tables

1. Total Sponsored Research Funding, 2009/10

Department	Tri-Council	Federal (excl Tri-Council)	Provincial	Industry	Other	Total
Architecture	$105,410	$20,000	$0	$280,000	$38,504	$443,914
Conrad	$0	$0	$0	$0	$0	$0
Chemical	$2,618,800	$772,670	$304,665	$1,877,210	$930,961	$6,504,305
Civil & Environmental	$1,932,133	$706,670	$1,496,630	$1,026,518	$1,498,766	$6,660,717
Electrical & Computer	$6,042,813	$2,280,595	$6,118,167	$1,991,613	$1,504,411	$17,937,599
Management Sciences	$552,356	$124,865	$50,000	$40,000	$43,741	$810,962
Mechanical & Mechatronics	$2,466,593	$1,747,321	$4,401,193	$1,019,023	$923,061	$10,557,190
Systems Design	$1,802,965	$832,250	$356,207	$1,121,660	$175,737	$4,288,819
Administrative Units	$19,016	$1,394,714	$2,244,462	$0	$157,462	$3,815,654
TOTAL	$15,540,086	$7,879,085	$14,971,324	$7,356,023	$5,272,643	$51,019,162

Total Sponsored Research Funding, 2010/11

Department	Tri-Council	Federal (excl Tri-Council)	Provincial	Industry	Other	Total
Architecture	$221,982	$0	$0	$0	$28,660	$250,642
Conrad	$0	$0	$0	$39,000	$0	$39,000
Chemical	$2,221,387	$812,848	$219,583	$952,314	$815,379	$5,021,511
Civil & Environmental	$2,414,791	$1,603,848	$2,228,456	$1,510,391	$1,416,115	$9,173,601
Electrical & Computer	$5,975,556	$2,175,059	$5,345,258	$3,111,081	$1,818,713	$18,425,667
Management Sciences	$620,620	$86,535	$50,000	$50,000	$16,000	$823,155
Mechanical & Mechatronics	$3,282,552	$4,298,188	$6,755,400	$1,985,028	$2,822,621	$19,143,789
Systems Design	$1,286,526	$681,246	$457,608	$614,340	$504,428	$3,544,148
Administrative Units	$18,000	$1,597,353	$2,244,462	$0	$79,282	$3,939,097
TOTAL	$16,041,414	$11,255,077	$17,300,767	$8,262,154	$7,501,198	$60,360,610

Total Sponsored Research Funding, 2011/12

Department	Tri-Council	Federal (excl Tri-Council)	Provincial	Industry	Other	Total
Architecture	$107,931	$1,900	$0	$0	$8,000	$117,831
Conrad	$0	$0	$0	$39,000	$8,000	$47,000
Chemical	$2,373,777	$984,804	$205,548	$3,501,044	$623,805	$7,688,978
Civil & Environmental	$2,240,011	$643,738	$2,518,965	$977,600	$1,390,123	$7,770,436
Electrical & Computer	$6,549,589	$2,194,106	$6,187,849	$4,250,349	$4,591,567	$23,773,458
Management Sciences	$700,646	$82,500	$89,000	$15,000	$0	$887,146
Mechanical & Mechatronics	$2,388,219	$6,417,160	$8,364,486	$1,351,549	$2,780,848	$21,302,262
Systems Design	$1,338,012	$724,600	$450,191	$680,869	$377,686	$3,571,359
Administrative Units	$12,700	$328,941	$0	$12,000	$254,309	$607,950
TOTAL	$15,710,885	$11,377,749	$17,816,039	$10,827,411	$10,034,339	$65,766,421

Total Sponsored Research Funding, 2012/13

Department	Tri-Council	Federal (excl Tri-Council)	Provincial	Industry	Other	Total
Architecture	$370,727	$4,360	$0	$0	$16,000	$391,087
Conrad	$0	$0	$0	$0	$411,497	$411,497
Chemical	$2,168,846	$854,066	$223,424	$1,769,316	$898,812	$5,914,463
Civil & Environmental	$3,106,550	$928,162	$5,054,018	$1,237,518	$2,031,306	$12,357,554
Electrical & Computer	$6,438,058	$2,063,635	$5,752,492	$3,556,092	$2,525,795	$20,336,072
Management Sciences	$854,853	$15,000	$41,000	$0	$66,000	$976,853
Mechanical & Mechatronics	$3,153,054	$4,197,401	$3,968,721	$1,353,971	$1,608,228	$14,281,376
Systems Design	$1,409,225	$439,450	$422,137	$1,061,595	$1,833,121	$5,165,527
Administrative Units	$14,524	$384,075	$0	$0	$263,521	$662,120
TOTAL	$17,515,837	$8,886,149	$15,461,792	$8,978,491	$9,654,281	$60,496,549

Total Sponsored Research Funding, 2013/14

Department	Tri-Council	Federal (excl Tri-Council)	Provincial	Industry	Other	Total
Architecture	$155,306	$52,330	$0	$22,500	$40,500	$270,636
Conrad	$15,000	$0	$0	$0	$437,168	$452,168
Chemical	$1,905,456	$428,860	$219,019	$1,082,777	$933,339	$4,569,451
Civil & Environmental	$2,544,449	$914,765	$3,509,516	$1,447,997	$2,655,917	$11,072,644
Electrical & Computer	$6,285,261	$1,735,310	$4,410,752	$2,942,463	$2,441,837	$17,815,624
Management Sciences	$443,035	$203,240	$255,170	$142,881	$67,161	$1,111,487
Mechanical & Mechatronics	$2,943,514	$3,970,346	$1,643,976	$2,091,439	$1,283,214	$11,932,489
Systems Design	$1,371,909	$429,765	$224,684	$1,056,565	$801,976	$3,884,899
Administrative Units	$559,200	$404,336	$0	$0	$239,697	$1,203,233
TOTAL	$16,223,130	$8,138,952	$10,263,118	$8,786,622	$8,900,810	$52,312,631

2. Total Tri-Council Funding, 2009/10

Department	CIHR	SSHRC	NSERC	Total
Architecture	$0	$105,410	$0	$105,410
Conrad	$0	$0	$0	$0
Chemical	$58,550	$0	$2,560,250	$2,618,800
Civil & Environmental	$57,717	$0	$1,874,416	$1,932,133
Electrical & Computer	$70,360	$0	$5,972,453	$6,042,813
Management Sciences	$0	$298,598	$253,758	$552,356
Mechanical & Mechatronics	$0	$0	$2,466,593	$2,466,593
Systems Design	$0	$0	$1,802,965	$1,802,965
Administrative Units	$0	$0	$19,016	$19,016
TOTAL	$186,627	$404,008	$14,949,451	$15,540,086

Total Tri-Council Funding, 2010/11

Department	CIHR	SSHRC	NSERC	Total
Architecture	$0	$221,982	$0	$221,982
Conrad	$0	$0	$0	$0
Chemical	$135,684	$0	$2,085,703	$2,221,387
Civil & Environmental	$57,717	$0	$2,357,074	$2,414,791
Electrical & Computer	$0	$0	$5,975,556	$5,975,556
Management Sciences	$0	$311,598	$309,022	$620,620
Mechanical & Mechatronics	$0	$0	$3,282,552	$3,282,552
Systems Design	$0	$0	$1,286,526	$1,286,526
Administrative Units	$0	$0	$18,000	$18,000
TOTAL	$193,401	$533,580	$15,314,433	$16,041,414

Total Tri-Council Funding 2011/12

Department	CIHR	SSHRC	NSERC	Total
Architecture	$0	$107,931	$0	$107,931
Conrad	$0	$0	$0	$0
Chemical	$76,634	$0	$2,297,143	$2,373,777
Civil & Environmental	$0	$0	$2,240,011	$2,240,011
Electrical & Computer	$0	$0	$6,549,589	$6,549,589
Management Sciences	$0	$311,098	$389,548	$700,646
Mechanical & Mechatronics	$0	$0	$2,388,219	$2,388,219
Systems Design	$0	$0	$1,338,012	$1,338,012
Administrative Units	$0	$0	$12,700	$12,700
TOTAL	$76,634	$419,029	$15,215,222	$15,710,885

Total Tri-Council Funding, 2012/13

Department	CIHR	SSHRC	NSERC	Total
Architecture	$0	$370,727	$0	$370,727
Conrad	$0	$0	$0	$0
Chemical	$97,919	$0	$2,070,927	$2,168,846
Civil & Environmental	$0	$0	$3,106,550	$3,106,550
Electrical & Computer	$14,900	$0	$6,423,158	$6,438,058
Management Sciences	$0	$336,230	$518,623	$854,853
Mechanical & Mechatronics	$0	$0	$3,153,054	$3,153,054
Systems Design	$0	$0	$1,409,225	$1,409,225
Administrative Units	$0	$0	$14,524	$14,524
TOTAL	$112,819	$706,957	$16,696,061	$17,515,837

Total Tri-Council Funding, 2013/14

Department	CIHR	SSHRC	NSERC	Total
Architecture	$0	$155,306	$0	$155,306
Conrad	$0	$15,000	$0	$15,000
Chemical	$0	$0	$1,905,456	$1,905,456
Civil & Environmental	$0	$0	$2,544,449	$2,544,449
Electrical & Computer	$74,500	$0	$6,210,761	$6,285,261
Management Sciences	$0	$54,035	$389,000	$443,035
Mechanical & Mechatronics	$0	$0	$2,943,514	$2,943,514
Systems Design	$0	$0	$1,371,909	$1,371,909
Administrative Units	$0	$0	$559,200	$559,200
TOTAL	$74,500	$224,341	$15,924,289	$16,223,130

3. NSERC Funding by type, 2009/10

Department	Discovery	RTI	Strategic	Industry	Other	Total
Architecture	$0	$0	$0	$0	$0	$0
Conrad	$0	$0	$0	$0	$0	$0
Chemical	$1,152,604	$446,745	$188,380	$635,701	$136,820	$2,560,250
Civil & Environmental	$867,922	$149,939	$0	$720,949	$135,606	$1,874,416
Electrical & Computer	$2,366,464	$359,970	$1,694,504	$1,353,015	$198,500	$5,972,453
Management Sciences	$253,758	$0	$0	$0	$0	$253,758
Mechanical & Mechatronics	$1,186,299	$299,275	$98,065	$712,235	$170,719	$2,466,593
Systems Design	$645,761	$336,223	$126,656	$489,525	$204,800	$1,802,965
Administrative Units	$0	$0	$0	$0	$19,016	$19,016
TOTAL	$6,472,808	$1,592,152	$2,107,605	$3,911,425	$865,461	$14,949,451

NSERC Funding by type, 2010/11

Department	Discovery	RTI	Strategic	Partnership	Other	Total
Architecture	$0	$0	$0	$0	$0	$0
Conrad	$0	$0	$0	$0	$0	$0
Chemical	$1,049,519	$315,091	$96,064	$486,709	$138,320	$2,085,703
Civil & Environmental	$963,600	$328,838	$0	$955,576	$109,060	$2,357,074
Electrical & Computer	$2,410,571	$300,687	$1,780,950	$1,314,348	$169,000	$5,975,556
Management Sciences	$290,355	$0	$0	$18,667	$0	$309,022
Mechanical & Mechatronics	$1,251,441	$292,482	$74,000	$1,513,810	$150,819	$3,282,552
Systems Design	$549,241	$0	$0	$509,465	$227,820	$1,286,526
Administrative Units	$0	$0	$0	$0	$18,000	$18,000
TOTAL	$6,514,727	$1,237,098	$1,951,014	$4,798,575	$813,019	$15,314,433

NSERC Funding by type, 2011/12

Department	Discovery	RTI	Strategic	Partnership	Other	Total
Architecture	$0	$0	$0	$0	$0	$0
Conrad	$0	$0	$0	$0	$0	$0
Chemical	$1,041,459	$259,873	$80,660	$784,831	$130,320	$2,297,143
Civil & Environmental	$973,700	$0	$0	$1,113,311	$153,000	$2,240,011
Electrical & Computer	$2,553,399	$167,286	$1,747,783	$1,918,620	$162,500	$6,549,589
Management Sciences	$328,500	$0	$0	$61,048	$0	$389,548
Mechanical & Mechatronics	$1,290,063	$0	$74,000	$853,156	$171,000	$2,388,219
Systems Design	$642,121	$127,183	$0	$458,708	$110,000	$1,338,012
Administrative Units	$0	$0	$0	$0	$12,700	$12,700
TOTAL	$6,829,242	$554,342	$1,902,443	$5,189,674	$739,520	$15,215,222

NSERC Funding by type, 2012/13

Department	Discovery	RTI	Strategic	Partnership	Other	Total
Architecture	$0	$0	$0	$0	$0	$0
Conrad	$0	$0	$0	$0	$0	$0
Chemical	$986,238	$54,585	$239,160	$705,444	$85,500	$2,070,927
Civil & Environmental	$929,700	$149,648	$0	$1,888,702	$138,500	$3,106,550
Electrical & Computer	$2,595,375	$193,590	$1,346,648	$2,126,545	$161,000	$6,423,158
Management Sciences	$407,000	$0	$0	$111,623	$0	$518,623
Mechanical & Mechatronics	$1,383,290	$114,371	$217,400	$1,193,993	$244,000	$3,153,054
Systems Design	$729,270	$149,400	$0	$433,055	$97,500	$1,409,225
Administrative Units	$0	$0	$0	$0	$14,524	$14,524
TOTAL	$7,030,873	$661,594	$1,803,208	$6,459,362	$741,024	$16,696,061

NSERC Funding by type, 2013/14

Department	Discovery	RTI	Strategic	Partnership	Other	Total
Architecture	$0	$0	$0	$0	$0	$0
Conrad	$0	$0	$0	$0	$0	$0
Chemical	$1,066,706	$0	$162,000	$676,750	$0	$1,905,456
Civil & Environmental	$837,499		$181,644	$1,525,306	$0	$2,544,449
Electrical & Computer	$2,751,073	$506,386	$678,360	$2,274,942	$0	$6,210,761
Management Sciences	$364,000	$0	$0	$25,000	$0	$389,000
Mechanical & Mechatronics	$1,365,000	$149,972	$138,900	$1,289,642	$0	$2,943,514
Systems Design	$650,000	$0	$129,200	$522,709	$70,000	$1,371,909
Administrative Units	$0	$0	$0	$0	$559,200	$559,200
TOTAL	$7,034,278	$656,358	$1,290,104	$6,304,349	$629,200	$15,924,289

4. Share of NSERC in Engineering Subject Groups, 2009/10-2013/14

Department	2009/10	2010/11	2011/12	2012/13	2013/14
Share of Awards	7.3%	7.2%	7.0%	7.0%	6.7%
Share of Funding	7.8%	7.7%	6.8%	7.0%	7.0%

5. Provincial Funding by type, 2009/10

Department	ORF:RE	ORF:RI	OCE	ERA	Other	Total
Architecture	$0	$0	$0	$0	$0	$0
Conrad	$0	$0	$0	$0	$0	$0
Chemical	$0	$133,920	$111,341	$59,404	$0	$304,665
Civil & Environmental	$821,403	$0	$180,597	$63,000	$431,630	$1,496,630
Electrical & Computer	$3,224,936	$1,314,905	$695,834	$229,560	$66,350	$5,531,585
Management Sciences	$0	$0	$50,000	$0	$0	$50,000
Mechanical & Mechatronics	$1,447,336	$195,791	$804,772	$173,209	$118,953	$2,740,061
Systems Design	$0	$0	$296,007	$28,000	$0	$324,007
Administrative Units	$0	$2,244,462	$0	$0	$0	$2,244,462
TOTAL	$5,493,675	$3,889,078	$2,138,552	$553,173	$616,933	$12,691,411

Provincial Funding by type, 2010/11

Department	ORF:RE	ORF:RI	OCE	ERA	Other	Total
Architecture	$0	$0	$0	$0	$0	$0
Conrad	$0	$0	$0	$0	$0	$0
Chemical	$58,339	$36,080	$56,970	$68,194	$0	$219,583
Civil & Environmental	$813,520	$468,909	$148,001	$28,000	$770,026	$2,228,456
Electrical & Computer	$3,800,713	$150,000	$719,273	$327,242	$348,030	$5,345,258
Management Sciences	$0	$0	$50,000	$0	$0	$50,000
Mechanical & Mechatronics	$3,679,831	$1,813,350	$928,190	$191,404	$142,625	$6,755,400
Systems Design	$0	$0	$429,608	$28,000	$0	$457,608
Administrative Units	$0	$2,244,462	$0	$0	$0	$2,244,462
TOTAL	$8,352,403	$4,712,801	$2,332,042	$642,840	$1,260,681	$17,300,767

Provincial Funding by type, 2011/12

Department	ORF:RE	ORF:RI	OCE	ERA	Other	Total
Architecture	$0	$0	$0	$0	$0	$0
Conrad	$0	$0	$0	$0	$0	$0
Chemical	$26,926	$0	$108,198	$20,424	$50,000	$205,548
Civil & Environmental	$695,705	$14,741	$411,280	$17,213	$1,380,025	$2,518,965
Electrical & Computer	$3,721,763	$1,182,170	$561,341	$296,044	$426,530	$6,187,849
Management Sciences	$0	$0	$89,000	$0	$0	$89,000
Mechanical & Mechatronics	$4,174,172	$3,022,776	$605,904	$102,284	$459,350	$8,364,486
Systems Design	$0	$60,000	$321,891	$0	$68,300	$450,191
Administrative Units	$0	$0	$0	$0	$0	$0
TOTAL	$8,618,566	$4,279,687	$2,097,614	$435,965	$2,384,206	$17,816,039

Provincial Funding by type, 2012/13

Department	ORF:RE	ORF:RI	OCE	ERA	Other	Total
Architecture	$0	$0	$0	$0	$0	$0
Conrad	$0	$0	$0	$0	$0	$0
Chemical	$0	$139,905	$17,175	$66,344	$0	$223,424
Civil & Environmental	$1,369,791	$1,568,313	$293,965	$30,751	$1,791,198	$5,054,018
Electrical & Computer	$4,048,950	$0	$1,002,010	$235,532	$466,000	$5,752,492
Management Sciences	$0	$0	$0	$0	$41,000	$41,000
Mechanical & Mechatronics	$2,523,331	$606,319	$465,999	$65,222	$307,850	$3,968,721
Systems Design	$0	$0	$265,443	$26,694	$130,000	$422,137
Administrative Units	$0	$0	$0	$0	$0	$0
TOTAL	$7,942,072	$2,314,537	$2,044,592	$424,543	$2,736,048	$15,461,792

Provincial Funding by type, 2013/14

Department	ORF:RE	ORF:RI	OCE	ERA	Other	Total
Architecture	$0	$0	$0	$0	$0	$0
Conrad	$0	$0	$0	$0	$0	$0
Chemical	$0	$0	$157,699	$61,320	$0	$219,019
Civil & Environmental	$462,123	$985,163	$339,565	$17,150	$1,705,515	$3,509,516
Electrical & Computer	$2,310,862	$424,419	$1,026,729	$98,742	$550,000	$4,410,752
Management Sciences	$0	$84,740	$0	$0	$170,430	$255,170
Mechanical & Mechatronics	$1,187,079	$47,666	$334,346	$17,035	$57,850	$1,643,976
Systems Design	$0	$0	$196,124	$28,560	$0	$224,684
Administrative Units	$0	$0	$0	$0	$0	$0
TOTAL	$3,960,064	$1,541,988	$2,054,463	$222,807	$2,483,795	$10,263,118

6. Industry Funding by source, 2009/10

Department	Canada	USA	Int'l	Total
Architecture	$125,000	$0	$0	$125,000
Conrad	$0	$0	$0	$0
Chemical	$323,722	$225,928	$1,297,560	$1,847,210
Civil & Environmental	$706,752	$22,500	$297,266	$1,026,518
Electrical & Computer	$1,649,305	$207,516	$64,357	$1,921,178
Management Sciences	$0	$0	$0	$0
Mechanical & Mechatronics	$509,162	$486,951	$22,910	$1,019,023
Systems Design	$857,083	$240,578	$0	$1,097,660
Administrative Units	$0	$0	$0	$0
TOTAL	$4,171,023	$1,183,472	$1,682,093	$7,036,588

Industry Funding by source, 2010/11

Department	Canada	USA	Int'l	Total
Architecture	$0	$0	$0	$0
Conrad	$39,000	$0	$0	$39,000
Chemical	$369,205	$172,520	$410,589	$952,314
Civil & Environmental	$1,474,639	$35,752	$0	$1,510,391
Electrical & Computer	$2,504,637	$540,679	$65,765	$3,111,081
Management Sciences	$50,000	$0	$0	$50,000
Mechanical & Mechatronics	$1,561,010	$286,366	$137,652	$1,985,028
Systems Design	$315,741	$298,599	$0	$614,340
Administrative Units	$0	$0	$0	$0
TOTAL	$6,314,232	$1,333,916	$614,006	$8,262,154

Industry Funding by source, 2011/12

Department	Canada	USA	Int'l	Total
Architecture	$0	$0	$0	$0
Conrad	$39,000	$0	$0	$39,000
Chemical	$162,043	$272,047	$3,066,954	$3,501,044
Civil & Environmental	$911,203	$66,397	$0	$977,600
Electrical & Computer	$3,399,720	$733,878	$116,750	$4,250,349
Management Sciences	$15,000	$0	$0	$15,000
Mechanical & Mechatronics	$991,971	$263,175	$96,404	$1,351,549
Systems Design	$232,950	$273,800	$174,119	$680,869
Administrative Units	$0	$12,000	$0	$12,000
TOTAL	$5,751,887	$1,621,296	$3,454,227	$10,827,411

Industry Funding by source, 2012/13

Department	Canada	USA	Int'l	Total
Architecture	$0	$0	$0	$0
Conrad	$0	$0	$0	$0
Chemical	$54,577	$155,299	$1,559,440	$1,769,316
Civil & Environmental	$921,891	$268,566	$47,060	$1,237,518
Electrical & Computer	$3,005,426	$349,772	$200,894	$3,556,092
Management Sciences	$0	$0	$0	$0
Mechanical & Mechatronics	$754,891	$528,550	$70,530	$1,353,971
Systems Design	$380,001	$545,316	$136,278	$1,061,595
Administrative Units	$0	$0	$0	$0
TOTAL	$5,116,786	$1,847,503	$2,014,202	$8,978,491

Industry Funding by source, 2013/14

Department	Canada	USA	Int'l	Total
Architecture	$22,500	$0	$0	$22,500
Conrad	$0	$0	$0	$0
Chemical	$501,183	$41,400	$540,194	$1,082,777
Civil & Environmental	$783,445	$664,552	$0	$1,447,997
Electrical & Computer	$2,454,933	$388,855	$98,675	$2,942,463
Management Sciences	$112,473	$30,408	$0	$142,881
Mechanical & Mechatronics	$1,332,241	$639,599	$119,600	$2,091,439
Systems Design	$681,501	$367,554	$7,510	$1,056,565
Administrative Units	$0	$0	$0	$0
TOTAL	$5,888,276	$2,132,367	$765,980	$8,786,622

7. Total Sponsored Research Funding:Faculty Ratio, 2009/10-2013/14

Department	2009/10	2010/11	2011/12	2012/13	2013/14
Architecture	$29,594	$16,709	$7,364	$23,005	$15,035
Conrad	n/a	$19,500	$15,667	$102,874	$113,042
Chemical	$209,816	$152,167	$226,146	$179,226	$145,062
Civil & Environmental	$200,322	$267,921	$214,416	$336,260	$318,179
Electrical & Computer	$245,721	$239,294	$308,746	$248,001	$214,646
Management Sciences	$42,128	$40,650	$36,583	$42,015	$47,703
Mechanical & Mechatronics	$211,144	$375,368	$409,659	$277,308	$236,287
Systems Design	$184,069	$166,392	$159,935	$231,327	$166,734
TOTAL	$207,564	$237,837	$248,344	$224,202	$194,905
Excluding Architecture & Conrad	$220,084	$253,689	$266,868	$239,899	$209,374

8. Total Sponsored Research Funding:Budget Ratio, 2009/10-2013/14

	2009/10	2010/11	2011/12	2012/13	2013/14
Faculty of Engineering TOTAL	0.82	0.94	0.97	0.83	0.81
Excluding Architecture & Conrad	0.88	1.01	1.05	0.88	0.86

9. Research Chair Holders, 2011

Department	Cda Rsch Chair	Endowed Chair	NSERC Chair	Other Chair	Univ Rsch Chair	Univ Prof
Architecture						1
Conrad		1				
Chemical	3		1		2	2
Civil & Environmental	3	1.5	2			
Electrical & Computer	6	2	5	1	6	
Management Sciences		0.5				
Mechanical & Mechatronics	5		1		1	
Systems Design	2		1			1
TOTAL	19.0	5.0	10.0	1.0	9.0	4.0

Research Chair Holders, 2012

Department	Cda Rsch Chair	Endowed Chair	NSERC Chair	Other Chair	Univ Rsch Chair	Univ Prof
Architecture						1
Conrad		1				
Chemical	4		1		2	2
Civil & Environmental	3	1.5	2			
Electrical & Computer	6	2	5	1	5	
Management Sciences		0.5				
Mechanical & Mechatronics	5		1		1	
Systems Design	2		1			1
TOTAL	20.0	5.0	10.0	1.0	8.0	4.0

Research Chair Holders, 2013

Department	Cda Rsch Chair	Endowed Chair	NSERC Chair	Other Chair	Univ Rsch Chair	Univ Prof
Architecture						1
Conrad						
Chemical	4				3	2
Civil & Environmental	2	1	2			
Electrical & Computer	6	2	4	1	5	
Management Sciences		1				
Mechanical & Mechatronics	3		1		1	
Systems Design	2		1			1
TOTAL	17.0	4.0	8.0	1.0	9.0	4.0

Research Chair Holders, 2014

Department	Cda Rsch Chair	Endowed Chair	NSERC Chair	Other Chair	Univ Rsch Chair	Univ Prof
Architecture						1
Conrad						
Chemical	4				1	2
Civil & Environmental	2	1.5	2			
Electrical & Computer	6	2	2	1	6	
Management Sciences	1	0.5				
Mechanical & Mechatronics	3		2		2	
Systems Design	3		1			
TOTAL	19.0	4.0	7.0	1.0	9.0	4.0

Research Chair Holders, 2014

Canada Research Chairs, Tier 1

Chair Holder	Title
Carl Haas, CEE	CRC in Infrastructure Construction and Management
Amir Khajepour, MME	CRC in Mechatronic Vehicle Systems
Amir Khandani, ECE	CRC in Wireless Systems
Raafat Mansour, ECE	CRC in Micro and Nano Integrated RF Systems
Alexander Penlidis, CHE	CRC in Engineering of Polymers with Tailor-made Properties
Catherine Rosenberg, ECE	CRC in the Future Internet
Michael Worswick, MME	CRC in Light Weight Materials under Extreme Deformation: Forming and Impact
En-hui Yang, ECE	CRC in Information Theory and Multimedia Data Compression
Weihua Zhuang, ECE	CRC in Wireless Communication Networks

Canada Research Chairs, Tier 2

Chair Holder	Title
Hossein Abouee Mehrizi, MSCI	CRC in Health-Care Operations Management
Pu Chen, CHE	CRC in Nano-Bio-Materials
C. Perry Chou, CHE	CRC in Novel Strategies for High-Level Recombinant Protein Production
Ehab El-Saadany, ECE	CRC in Energy Systems
Chris Eliasmith, SDE	CRC in Theoretical Neuroscience
Frank Gu, CHE	CRC in Advanced Targeted Delivery Systems
Carolyn Ren, MME	CRC in Lab-on-a-Chip Technology
Susan Tighe, CEE	CRC in Pavements and Infrastructure Management
Alexander Wong, SDE	CRC in Medical Imaging Systems
John Yeow, SDE	CRC in Micro and Nano Devices

NSERC Industrial Research Chairs

Chair Holder	Title
Adrian Gerlich, MME	NSERC/TransCanada Industrial Research Chair in Welding for Energy Infrastructure
Peter Huck, CEE	NSERC Chair in Water Treatment
Amir Khandani, ECE	NSERC/Nortel Chair in Advanced Telecommunications Technologies
John McPhee, SDE	NSERC/Toyota/Maplesoft Chair in Mathematics-Based Modelling and Design
Mahesh Pandey, CEE	NSERC/UNENE Chair in Risk-Based Life Cycle Management of Engineering Systems
Ali Safavi-Naeini, ECE	NSERC/Research in Motion Chair in Intelligent Integrated Radio/Antenna Systems

Endowed Chairs

Chair Holder	Title
Claudio Canizares, ECE	Hydro One Research Chair
Sujeet Chaudhuri, ECE	Val O'Donovan Chair in RF/Microwaves and Photonics
Jatin Nathwani, CEE/MSci	Ontario Research Chair in Public Policy and Sustainable Energy Management
Susan Tighe, CEE	Norman W. McLeod Professor in Sustainable Pavement Engineering

Other Research/Design Chairs

Chair Holder	Title
Steve Lambert, MME	NSERC Design Chair in Collaborative Design
Siva Sivoththaman, ECE	Ontario Research Chair in Renewable Energy Technologies and Health

University Research Chairs and University Professors

University Research Chairs	University Professors
Rick Culham, MME	Keith Hipel, SDE
Shesha Jayaram, ECE	Flora Ng, CHE
Mohamed Kamel, ECE	Garry Rempel, CHE
Fakhri Karray, ECE	Robert Jan van Pelt, ARCH
Ravi Mazumdar, ECE	
Manoj Sachdev, ECE	
Xuemin Shen, ECE	
Michael Tam, CHE	
Norman Zhou, MME	

10. University of Waterloo Publications in Engineering or Materials Science Journals Indexed by Thomson Reuters, 2005-2013

	2005-2009	2006-2010	2007-2011	2008-2012	2009-2013
Engineering Journals	1610	1710	1796	1869	1909
Materials Science Journals	358	422	468	536	597

11. Citations to University of Waterloo Publications in Engineering or Materials Science Journals Indexed by Thomson Reuters, 2005-2013

	2005-2009	2006-2010	2007-2011	2008-2012	2009-2013
Engineering Journals	5639	6314	6896	7550	8076
Materials Science Journals	1158	1626	2285	3229	4631

12. Impact Relative to Subject of University of Waterloo Publications in Journals Indexed by Thomson Reuters, 2005-2013

	2005-2009	2006-2010	2007-2011	2008-2012	2009-2013
Engineering Journals	1.3	1.3	1.3	1.3	1.3
Materials Science Journals	0.9	1.0	1.1	1.3	1.5

E. Women in Engineering Data Tables

1. Women in Engineering Disciplines, 2009-2013

	2009		2010		2011		2012		2013	
	#	%	#	%	#	%	#	%	#	%
Undergraduate First-year Class	229	17.1%	240	16.1%	305	20.6%	334	21.0%	349	21.2%
All Undergraduate Students	934	16.7%	997	16.7%	1096	17.7%	1197	18.5%	1234	18.6%
Undergraduate Degrees Granted	122	15.5%	134	15.5%	162	17.1%	156	15.8%	218	20.1%
All Graduate Students	368	22.0%	380	22.1%	382	22.2%	407	22.3%	392	22.4%
All Graduate Degrees Granted	100	22.5%	109	20.8%	125	22.0%	134	25.3%	145	22.8%
PhD Degrees Granted	20	20.8%	14	14.9%	17	14.7%	26	22.6%	22	16.4%
Faculty Members	27.5	11.9%	31	12.7%	32	12.5%	36	13.4%	37	13.5%

2. Women in Architecture, 2009-2013

	2009		2010		2011		2012		2013	
	#	%	#	%	#	%	#	%	#	%
Undergraduate First-year Class	35	50.0%	45	59.2%	45	60.8%	43	56.6%	42	55.3%
All Undergraduate Students	189	54.3%	200	54.3%	204	58.0%	209	56.5%	197	55.3%
Undergraduate Degrees Granted	33	51.6%	32	57.1%	40	52.6%	33	58.9%	45	57.7%
All Graduate Students	74	49.7%	61	50.0%	62	52.1%	62	51.2%	54	54.0%
All Graduate Degrees Granted	23	71.9%	24	49.0%	27	61.4%	20	51.3%	26	61.9%
Faculty Members	6	35.3%	6	37.5%	6	37.5%	7	38.9%	7	36.8%

F. Internationalization Data Tables

1. International Students, 2009-2013

	2009		2010		2011		2012		2013	
	#	%	#	%	#	%	#	%	#	%
Undergraduate New Admissions	138	9.8%	172	11.0%	222	14.3%	218	13.9%	208	13.1%
All Undergraduate Students	375	6.3%	462	7.3%	594	9.1%	703	10.3%	782	11.2%
Undergraduate Degrees Granted	26	3.1%	30	3.3%	37	3.6%	51	4.9%	59	5.1%
Undergraduate Co-op Work Terms	635	10.0%	801	11.8%	847	12.1%	1074	14.5%	1122	14.6%
Outgoing Exchange Students	74	n/a	89	n/a	96	n/a	91	n/a	105	n/a
Incoming Exchange Students	180	n/a	204	n/a	205	n/a	205	n/a	257	n/a
All Graduate Students	556	30.6%	626	33.9%	682	37.3%	806	41.4%	824	44.5%
All Graduate Degrees Granted	85	19.0%	110	19.2%	149	24.3%	171	30.1%	243	35.8%

G. Advancement Data Tables

1. Total Alumni, 2009-2013

	2009		2010		2011		2012		2013	
	#	% reach-able*	#	% reach-able*	#	% reach-able*	#	% reach-able*	#	% reach-able*
Architecture	1,817	88.1%	1,871	89.0%	1,948	89.7%	2,017	88.2%	2,106	88.5%
Conrad	198	99.5%	250	99.6%	293	99.3%	321	99.1%	371	99.5%
Chemical	3,883	88.8%	4,067	89.4%	4,248	89.8%	4,443	88.6%	4,636	89.0%
Civil & Environmental	6,049	89.6%	6,195	90.1%	6,365	90.2%	6,576	88.4%	6,801	88.5%
Electrical & Computer	8,659	91.1%	9,088	91.8%	9,607	92.1%	10,196	90.6%	10,857	91.0%
Management Sciences	1,308	83.6%	1,387	85.1%	1,521	86.3%	1,650	85.3%	1,767	86.2%
Mechanical & Mechatronics	6,939	90.8%	7,195	91.3%	7,455	91.4%	7,751	90.0%	7,999	90.2%
Systems Design	2,901	92.5%	2,979	92.7%	3,074	92.9%	3,186	91.5%	3,289	91.8%
TOTAL	31,754	90.1%	33,032	90.8%	34,511	91.1%	36,140	89.6%	37,826	89.9%

2. Engineering Alumni Donating to University of Waterloo, 2009-2013

	2009		2010		2011		2012		2013	
	#	% **	#	% **	#	% **	#	% **	#	% **
Architecture	103	6.4%	55	3.3%	87	5.0%	69	3.9%	96	5.2%
Conrad	11	5.6%	4	1.6%	8	2.7%	3	0.9%	2	0.5%
Chemical	240	7.0%	264	7.3%	340	8.9%	284	7.2%	275	6.7%
Civil & Environmental	357	6.6%	399	7.2%	472	8.2%	442	7.6%	452	7.5%
Electrical & Computer	464	5.9%	556	6.7%	662	7.5%	504	5.5%	563	5.7%
Management Sciences	55	5.0%	71	6.0%	87	6.6%	78	5.5%	89	5.8%
Mechanical & Mechatronics	406	6.4%	471	7.2%	581	8.5%	502	7.2%	518	7.2%
Systems Design	164	6.1%	248	9.0%	246	8.6%	190	6.5%	231	7.7%
TOTAL	1,800	6.3%	2,068	6.9%	2,483	7.9%	2,072	6.4%	2,226	6.5%

* Reachable alumni are those for whom the Alumni Affairs Office has at least one current method of contact

** % donating is calculated as the percentage of reachable alumni

3. Engineering Alumni Donating to University of Waterloo, lifetime

Department	# Donating	% Donating
Architecture	612	32.8%
Conrad	36	9.8%
Chemical	1,888	45.7%
Civil & Environmental	2,872	47.7%
Electrical & Computer	3,732	37.8%
Management Sciences	490	32.2%
Mechanical & Mechatronics	3,404	47.2%
Systems Design	1,441	47.7%
TOTAL	14,475	42.6%

4. Funds Raised for the Faculty of Engineering, 2010/11-2013/14

	2010/11	2011/12	2012/13	2013/14
Cash Received	$5,236,195	$5,001,984	$8,001,495	$9,123,594
New Pledges Received	$10,600,000	$6,599,720	$6,688,889	$33,819,527

5. Campaign Progress to May 1, 2014

Priority Project	Goal	$ Raised	% of Goal
Facilities	$61.5 M	$73.2 M	119.0%
Graduate Scholarships	$23.0 M	$15.8 M	68.7%
Chairs	$30.0 M	$11.1 M	37.0%
Other	$5.5 M	$30.9 M	561.8%
TOTAL	$120 M	$131.0 M	109.2%

6. Alumni Attending Selected Class Reunions, 2013

Department	5	10	15	20	25	30	35	40	45	50
Chemical	1.9%	1.7%	1.4%	27.3%	24.6%	27.1%	0.0%	7.8%	20.6%	25.0%
Civil & Environmental	1.9%	6.2%	0.9%	2.2%	13.2%	0.0%	9.5%	14.0%	8.7%	39.5%
Electrical & Computer	1.5%	0.0%	1.3%	0.9%	7.3%	9.5%	6.3%	8.6%	17.4%	61.1%
Mechanical & Mechatronics	8.3%	0.0%	0.9%	5.7%	0.8%	0.7%	6.5%	2.8%	10.2%	60.0%
Systems Design	7.6%	0.0%	0.0%	0.0%	1.5%	0.0%	0.0%	20.0%	0.0%	0.0%
OVERALL PARTICIPATION	3.4%	1.3%	0.7%	2.3%	7.3%	6.4%	5.2%	8.1%	13.5%	47.5%

7. Alumni Events, 2013

Event	City	Date	Attendance*
Waterloo Engineering Alumni & Friends Reception at TRB	Washington, DC	01/15/13	127
Waterloo Engineering Alumni Ski Day	Collingwood, ON	01/18/13	255
Waterloo Engineering Curling Social	Toronto, ON	02/02/13	82
Waterloo Engineering Alumni & Friends Reception at the IEEE 2013 International Solid-State Circuits Conference (ISSCC)	San Francisco, CA	02/19/13	54
Waterloo Engineering Alumni Reception in San Francisco	San Francisco, CA	02/20/13	79
Waterloo Engineering Wine Tasting Reception	Vancouver, BC	04/04/13	58
Boston Beer Tasting Reception	Boston, MA	05/02/13	60
Waterloo Architecture (and Civil) Alumni Reception at the Ontario Association of Architects Conference	Toronto, ON	05/08/13	123
MBETConnect	Toronto, ON	05/11/13	160
Waterloo Engineering Wine Tasting Reception	Calgary, ON	05/23/13	68
Waterloo Engineering Wine Tasting Reception	Ottawa, ON	06/06/13	55
Rob Chaplinsky Entrepreneurship Event	Menlo Park, CA	06/13/13	120
Engineering Class of 2013 Post-Convocation Receptions (2)	Waterloo, ON	06/15/13	2825
Reunion - 50th (Class of 1963)	Waterloo, ON	09/27-29/13	73
Reunions (Classes of ‘68, ‘73, ‘78, ‘83, ‘88, ‘93, ‘98,’03 & ‘08)	Waterloo, ON	09/28-29/13	550
Engineering Class of 2013 Post-Convocation Reception	Waterloo, ON	10/26/13	760
Alumni Reception in Hong Kong	Hong Kong, China	11/29/13	40
Rick Haldenby Celebration	Cambridge, ON	11/30/13	108

*attendance includes alumni and guests

8. Dean's Advisory Council Members

Name	Title
Paul Spafford (Chair)	Vice Chairman and Managing Director, CIBC World Markets Inc.
Art Church (Vice Chair)	President & CEO, Mancor Industries
John Baker	President & CEO, Desire2Learn
Doug Beynon	President & CEO, Beynon Enterprises
Thomas Brzustowski	Chair of the Board, Institute for Quantum Computing
Savvas Chamberlain	CEO & Chairman, EXEL Research Inc
Rob Chaplinksy	Managing Director, Bridgescale Partners
Erin Chapple	Group Program Manager, Microsoft Corporation
Rod Coutts	Chairman, Navcast Inc.
Murray Gamble	President, The C3 Group
Tom Jenkins	Executive Chairman and Chief Strategy Officer, Open Text Corporation
Jacques Lamarre	Strategic Advisor, Heenan Blaikie, LLP
Patrick Lamarre	Executive Vice President, Kiewit Energy Canada
Bob Magee	President & Chief Executive Officer, The Woodbridge Group
Paul Moynihan	Managing Director, Rothschild
Kevin Murai	CEO and Member of the Board of Directors, Synnex Corporation
Vivienne Ojala	President & CEO, Brock Solutions
Mike Panayi	President, Pinnacle Consultants Inc.
John Saabas	President, Pratt & Whitney Canada Corporation
Ray Tanguay	President, Toyota Motor Manufacturing Canada Inc.
Bill Tatham	CEO, NexJ Systems Inc.
Glenn Turchan	Executive Vice President, Conestoga-Rovers & Associates
Don Walker	Co-Chief Executive Officer, Magna International Inc.
Douglas (Doug) Wright	Founding Dean, Engineering, Former President University of Waterloo

H. Space Data Tables

1. Space Holdings (nasm), 2010-2014

	2009/10	2010/11	2011/12	2012/13	2013/14
Existing Space	39,133	39,133	47,334	52,668	55,613
Additional Space Constructed	0	8,201	5,334	2,945	0
Total Holdings, May 1	39,133	47,334	52,668	55,613	55,613

I. Data Notes

Acronyms and Abbreviations

Acad	Academic Unit (department, school or academic centre)
Admin	Administrative Unit or Administrative Staff
ARCH	Architecture (school or program)
Assoc Prof	Associate Professor
Asst Prof	Assistant Professor
CEE	Civil & Environmental Engineering Department
CHE	Chemical Engineering (department or program)
CIHR	Canadian Institutes for Health Research
CIVE	Civil Engineering (program)
CE	Computer Engineering (program)
Conrad	Conrad Business, Entrepreneurship & Technology Centre
CPR	Canadian or Permanent Resident
Def Term	Definite Term
DOE	Dean of Engineering Office
ECE	Electrical & Computer Engineering Department
EE	Electrical Engineering (program)
Enrol't	Enrolment
ENVE	Environmental Engineering (program)
ERA	Early Researcher Award (formerly Premier's Research Excellence Award or PREA)
Ext	External
FOE	Faculty of Engineering
FTE	Full-time equivalent
GENE	Undergraduate students not registered in an academic program (e.g. exchange students and students registered in the Qualifying Program for Readmission)
GEOE	Geological Engineering (program)
GRS	Graduate Research Studentship
Int'l	International
Lect	Lecturer
ME	Mechanical Engineering (program)
MCTR	Mechatronics Engineering (program)
MGMT	Management Engineering (program)
MME	Mechanical & Mechatronics Engineering Department
MSCI	Management Sciences Department
MTCU	Ministry of Training, Colleges and Universities
NANTE	Nanotechnology Engineering (program)
nasm	Net assignable square metre
Non-Deg	Non-degree (for graduate students, includes diploma and certificate students)
NSERC	Natural Sciences and Engineering Research Council
OCE	Ontario Centres of Excellence
ORF	Ontario Research Fund (RE = Research Excellence & RI = Research Infrastructure)
PostDoc	Post-doctoral Fellow
Prof	Professor
Prof Master	Professional Master (i.e. coursework; without a thesis)
Rsch Assoc	Research Associate
Rsch Master	Research Master (i.e. with a thesis)
Rsch Prof	Research Professor
RTI	Research Tools and Instruments (NSERC Program)
Schlp	Scholarship
SDE	Systems Design Engineering (department or program)
SE	Software Engineering (program)
SSHRC	Social Sciences and Humanities Research Council
TA	Teaching Assistant
Tech	Technical Staff
TTS	Tenured and tenure-stream faculty
UAE	United Arab Emirates (where Waterloo formerly had a campus, in Dubai)
Univ	University

Notes on Tables

1 Key Metrics
Space Holdings excludes Architecture and Conrad
In May 2014 previous space holdings calculations, which included projections for space under construction, were updated with actual figures. Baseline and previous year data have been restated with actuals.

2 Key Performance Indicators
Undergraduate Students/Faculty excludes CSTV faculty (included elsewhere in Systems Design) and excludes proportion of students in joint programs with other Faculties
Graduate Students/Faculty includes only tenured and tenure-stream faculty
Space Holdings/Student, Sponsored Research Funds/Faculty and Sponsored Research Funds/Budget exclude Architecture and Conrad
Budget/Student is widely considered an acceptable measure of the richness of a unit's educational program and is not intended to represent the amount of money spent directly on each student

3 Institutional Context
Source for each metric is consistent with its measurement described below

4 Provincial and National Context
Source: Engineers Canada enrolment and degrees report (most recent available)
Per Engineers Canada guidelines, excludes Architecture and new programs yet to be accredited

Data Definitions and Sources

A1 Total Regular Faculty
Source: Dean of Engineering Office | As of: May 1
Excludes definite-term, research and visiting professors; excludes faculty members in full-time senior university administrative positions (e.g. president); Excludes positions not yet filled on May 1
Systems Design includes CSTV

A2 Distribution of Regular Faculty by PEng Status
Source: Associate Dean, Co-operative Education & Professional Affairs | As of: May 1
Excludes faculty in Architecture, Conrad and CSTV; ineligible=degree(s)from a discipline ineligible for PEng

A3 Distribution of Regular Faculty by Age
Source: Dean of Engineering Office | As of: May 1

A4 Distribution of TTS Faculty by PhD School
Source: Dean of Engineering Office | As of: May 1
Excludes faculty who do not hold a PhD

A5 Total Non-regular and Non-faculty Appointments
Source: Dean of Engineering Office | As of: May 1
Count of current appointments on May 1(note: a small proportion of individuals might hold multiple appointments)

A6 Selected Major Faculty Awards and Honours
Source: Dean of Engineering Office | As of: Dec. 31

A7 FTE Staff
Source: Waterloo Human Resources | As of: May 1
Full-time equivalent filled positions paid from the operating budget
Research institutes include WatCAR, WIN and WISE; in previous years' reports, Graduate, Research and Outreach Offices were included in Dean's Office-admin; Undergraduate Office includes Teaching Office and Student Design Centre staff
Excludes positions which were under recruitment/not yet filled on May 1

A8 Distribution of FTE Staff by Age
Source: Waterloo Human Resource | As of: May 1

A9 Staff Awards and Honours
Source: Dean of Engineering Office | As of: Dec. 31

A10 Faculty:Staff Ratios
Total regular faculty/FTE staff paid from the operating budget
Faculty Total includes staff and faculty in administrative units (e.g. Dean's Office, Machine Shop, Undergraduate Office, etc.); Academic Units Only excludes support units

B1 Total Undergraduate Enrolment (head count)
Source: Waterloo Institutional Analysis and Planning Office | As of: Nov.1
All undergraduates registered in the fall term (in class or on co-op) on MTCU count date
Includes students on official co-op work term; includes all students in programs offered jointly with other faculties (i.e. software and nanotechnology); excludes part-time students; excludes students in GENE

B2 FTE Undergraduate Enrolment
Source: Waterloo Institutional Analysis and Planning Office | As of: March 1
Equivalent student registrations in two academic terms in a year; this counters the impact of our co-op program, due to which a proportion of students will have 2 work terms and 1 academic term in a given year
Annual FTE= (spring + fall + winter registrations, excluding students on co-op)/2
Includes all students in programs offered jointly with other faculties (i.e. software and nanotechnology); excludes part-time students; excludes students in GENE

B3 Undergraduate Degrees Granted
Source: Waterloo Institutional Analysis and Planning Office | As of: Dec. 31
Total engineering undergraduate students graduating in the calendar year
Includes all students in programs offered jointly with other faculties (i.e. software and nanotechnology); count by first major (double-major degrees are counted only once)

B4 Undergraduate Year One New Admissions
Source: Waterloo Institutional Analysis and Planning Office | As of: Nov. 1
Total new engineering undergraduates registered in the fall term on MTCU count date
Includes all students in programs offered jointly with other faculties (i.e. software and nanotechnology); Total 1A Enrolment includes continuing students returning to 1A

B5 Undergraduate Admissions by Average Grade Ranges
Source: Waterloo Registrar's Office | As of: Nov. 1
Average based on best final 6 U or M courses; averages with .5% are rounded up (e.g.94.5% to 94.9% are included in 95%)

B6 Undergraduate Students:Faculty Ratio
FTE undergraduate students/regular faculty members
Regular faculty here excludes CSTV faculty (included elsewhere in Systems Design); FTE students here exclude ½ of software students and ⅓ of nanotechnology students; mechatronics students are allocated 3/5 to MME, 1/5 to ECE and 1/5 to SDE

B7 Undergraduate Degrees Granted:Faculty Ratio
Engineering undergraduate degrees granted/regular faculty members
Regular faculty here excludes CSTV faculty (included elsewhere in Systems Design); FTE students here exclude ½ of software students and ⅓ of nanotechnology students; mechatronics students are allocated 3/5 to MME, 1/5 to ECE and 1/5 to SDE

B8 Co-op Employment
Source: Waterloo Co-operative Education & Career Action Office | As of: Dec. 31
Excludes students who advised CECA that they were not seeking employment or who did not participate in the interview process and did not provide information on their status
% international placements is share of "employed" terms outside of Canada

B9 Co-op Earnings
Source: Waterloo Co-operative Education & Career Action Office JOBMINE | As of: May 1
Total student earnings are estimated using average salaries
Does not include wages earned internationally

B10 Undergraduate Exchange Participation
Source: Engineering Exchange Office | As of: Dec. 31

C1 Total Graduate Enrolment (head count)
Source: Waterloo Institutional Analysis and Planning Office | As of: Nov.1
All graduate students registered in fall term (full-time or part-time) on MTCU count date
Nanotechnology students are counted in the department in which they are registered; includes non-degree students (which include diploma and certificate programs)

C2 FTE Graduate Enrolment
Source: Waterloo Institutional Analysis and Planning Office | As of: May 1
FTE = (SpringFTE+FallFTE+WinterFTE)/3 | Each term's FTE = FT+(PT*0.3)
Nanotechnology students are counted in the department in which they are registered; non-degree students are excluded

C3 Graduate Degrees Granted
Source: Waterloo Institutional Analysis and Planning Office | As of: Dec. 31
Total engineering graduate students graduating in the calendar year
Nanotechnology students are counted in the department in which they are registered; count by first major (double-major degrees are counted only once)

C4 FTE Graduate Student Admissions
Source: Waterloo Institutional Analysis and Planning Office | As of: Nov.1
Total of FTE (FT+(PT*0.3)) of all new graduate student admissions in 3 terms (calendar year)
Nanotechnology students are counted in the department in which they are registered; non-degree students are excluded; coursed-based master are included with professional master prior to 2012

C5 Graduate Students:Faculty Ratio
FTE graduate students/tenured and tenure-stream faculty members
All Students includes non-degree students; Research Students includes PhD+Research Master students only; totals might not add precisely due to rounding

C6 Graduate Degrees Granted:Faculty Ratio
Graduate degrees granted/TTS faculty members

C7 Graduate Proportion of Total FTE Enrolment
FTE graduate students/(FTE graduate students+FTE undergraduate students)

C8 Graduate Student Financial Support
Source: Waterloo Graduate Studies Office | As of: May 1

D1 Total Sponsored Research Funding
Source: Waterloo Office of Research | As of: May 1
Research funding data presented in multi-year graphs are the most up-to-date data available, and include Office of Research corrections made to previous years' funding after the final report for that year. Tabular data are not restated.

D2 Total Tri-Council Funding
Source: Waterloo Office of Research | As of: May 1

D3 NSERC Funding by type
Source: Waterloo Office of Research | As of: May 1
Discovery includes Accelerator Supplements; Partnerships was formerly called Industry

D4 University of Waterloo Share of NSERC Funding and Awards in Engineering Subject Groups
Source: NSERC Awards Database | As of: May 1
Includes NSERC awards and funding earned by any University of Waterloo researcher in 19 NSERC research subject areas (comprised of 157 subjects) identified as related to engineering (Agricultural Eng, Artificial Intelligence, Biomedical Eng, Chemical Eng, Civil Eng, Design&Manufacturing, Electrical&Electronic Eng, Environmental Eng, Fluid Mechanics, Forest Eng, Fuel&Energy Tech, Industrial Eng, Information Tech, Materials Sci&Tech, Mechanical Eng, Mining&Mineral Processing, Nuclear Eng, Robotics, Structural Eng)

D5 Provincial Funding by type
Source: Waterloo Office of Research | As of: May 1
Other includes Ministry, FedDev and Ontario Research Chair funding

D6 Industry Funding by source
Source: Waterloo Office of Research | As of: May 1

D7 Total Sponsored Research Funding:Faculty Ratio
Sponsored research funds/tenured and tenure-stream faculty members

D8 Total Sponsored Research Funding:Budget Ratio
Sponsored research funds/permanent recurring budget

D9 Research Chair Holders
Source: Engineering Research Office & Dean of Engineering Office | As of: May 1

D10 University of Waterloo Publications in Engineering or Materials Science Journals Indexed by Thomson Reuters
Source: InCites™, Thomson Reuters (2012). Report Created: 28-May-14 Data Processed March 31, 2014 Data Source: Web of Science ® | As of: March 31, 2014
Limited to publications in journals indexed by Thomson Reuters. Includes publications by all researchers affiliated with the University of Waterloo in journals classified by Thomson Reuters Essential Science Indicators as engineering or materials science. Includes all documents published in each five-year period.

D11 Citations to University of Waterloo Publications in Engineering or Materials Science Journals Indexed by Thomson Reuters
Source: InCites™, Thomson Reuters (2012). Report Created: 28-May-14 Data Processed March 31, 2014 Data Source: Web of Science ® | As of: March 31, 2014
Includes citations to all publications that were included in the counts for item D10, above. Data is limited to citations in journals indexed by Thomson Reuters. Citation counts for each five-year period specified are only from citing articles in the same five-year period as the document publication dates. (E.g., 1991-1995 includes citations to documents published between 1991-1995 period, in citing articles that were also published between 1991-1995. A publication from 1993 that was cited in a citing article published in 1996 would not be counted here: It would be counted in the time periods of 1992-1996 and 1993-1997 only).

D12 Impact Relative to Subject (Engineering or Materials Science) of University of Waterloo Publications in Journals Indexed by Thomson Reuters
Source: InCites™, Thomson Reuters (2012). Report Created: 28-May-14 Data Processed March 31, 2014 Data Source: Web of Science ® | As of: March 31, 2014
Impact relative to subject area=Impact (citations/documents) of an institution in a subject area relative to the impact of all institutions in the subject area overall. Publications and citations are both limited to Thomson Reuters-indexed journals and to publication in the five-year time period indicated.

E1 Women in Engineering Disciplines and Women in Architecture
& Undergraduate year one new admissions excludes continuing students, Nov. 1
E2 All undergraduate students = head count, Nov. 1
Undergraduate degrees granted in the calendar year, Dec. 31
All graduate students = head count, Nov. 1
Graduate degrees granted for the calendar year, Dec. 31
Professors = regular faculty, May 1

F1 International Students
Undergraduate year one new admissions excludes continuing students, Nov. 1
All undergraduate students = head count, Nov. 1
Undergraduate degrees granted in the calendar year, Dec. 31
Undergraduate Co-op Work Terms = # and % of "employed" terms outside Canada, Dec. 31
All graduate students = head count, Nov. 1
Graduate degrees granted for the calendar year, Dec. 31
Outgoing Exchange Students = Waterloo students on exchange elsewhere, Dec. 31
Incoming Exchange Students = Students studying at Waterloo on exchange, Dec. 31

G1 Total Alumni
Source: Waterloo Office of Alumni Affairs | As of: Dec. 31
Total of all alumni who have graduated with a degree from Waterloo Engineering
Includes all Architecture, Conrad, and software engineering alumni; includes deceased and honorary alumni; count by preferred major (each alumnus is counted only once)
G2 Engineering Alumni Donating to the University of Waterloo in the year
Source: Waterloo Office of Alumni Affairs | As of: Dec. 31
Includes donations by alumni in the given calendar year
G3 Engineering Alumni Donating to the University of Waterloo in their lifetime
Source: Waterloo Office of Alumni Affairs | As of: Dec. 31
Includes donations by alumni at any time before December 31 of the current year
G4 Funds Raised for the Faculty of Engineering
Source: Waterloo Office of Development | As of: May 1
Cash Received includes all cash, gifts-in-kind and other gifts received (including payments on pledges counted in previous years); New pledges includes all pledges, cash, gifts-in-kind and other gifts raised (including those not paid this year)
G5 Campaign Progress to Date
Source: Waterloo Office of Development | As of: May 1
Other priority projects include the Rome Program and Conrad, and other donations received for projects outside the identified priorities
G6 Alumni Attending Selected Class Reunions
Source: Engineering Alumni Office | As of: Dec. 31
Includes only departments with an undergraduate program in the given reunion year
G7 Alumni Events
Source: Engineering Alumni Office | As of: Dec. 31
G8 Dean's Advisory Council Members
Source: Engineering Advancement Office | As of: May 1

H1 Space Holdings
Source: Waterloo Institutional Analysis and Planning Office | As of: May 1
Space Holdings excludes Architecture and Conrad
In May 2014 previous space holdings calculations, which included projections for space under construction, were updated with actual figures. Baseline and previous year data have been restated with actuals.