VISION 2010
Final Report

A Blueprint for Excellence in Engineering Education and Research, 2005 - 2010

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Dean of Engineering
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WATERLOO
ENGINEERING

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I EXECUTIVE SUMMARY

In 2004, Waterloo Engineering initiated a comprehensive planning exercise. Following 18 months of self-study, analysis, broad engagement and external reviews, *Vision 2010: A Blueprint for Excellence in Engineering Education and Research* was published in May 2006. This strategic plan sought to take what was already a very good school of engineering, renowned for excellence in a number of areas, and move it forward.

The Vision 2010 plan set an ambitious aspiration for Waterloo Engineering to be widely recognized as Canada's premier engineering school and counted among the leading schools of engineering in North America. The external assessors who visited Waterloo in 2005 to review our plans confirmed that our undergraduate program, along with the co-operative education system at its core, were second to none in Canada. Room for improvement was identified in the intensity and visibility of our research and graduate studies portfolios. And, as very few Canadian schools are counted among the North American leaders, we recognized that much work was required to reach a level of recognized excellence commensurate with the leading research-intensive engineering schools in North America.

By all measures, Waterloo Engineering has moved forward significantly over the Vision 2010 plan period. We have made excellent progress on all of our original Vision 2010 goals and remained sufficiently flexible so as to capitalize on opportunities and address challenges unforeseen at the outset of the plan.

Without compromising our renowned undergraduate program – indeed, while enhancing it – we have become more research intensive and have developed a stronger balance of graduate to undergraduate students. We have increased our faculty complement by a large margin, decreasing undergraduate student-to-faculty ratios and departmental teaching loads while also increasing research intensity and graduate student supervision rates. We have made measurable progress toward increased internationalization, most recently through our participation in the new UW-UAE campus in Dubai, United Arab Emirates. We addressed our pressing space deficit through a detailed space audit and subsequent capital plan, the results of which are already seen on campus: the stunning new Engineering 5 building, home to our world-class student design centre, is officially opening this fall. Two other buildings – phase one of Engineering 6, funded in part through the provincial and federal government's Knowledge Infrastructure Program, and the Mike and Ophelia Lazaridis Quantum Nano Centre, which will be home to our nanotechnology program – are under construction. The Engineering 5 groundbreaking also served as the launch of Waterloo Engineering's Vision 2010 Campaign, with fundraising priorities aligned in support of the Vision 2010 strategic plan.

Against the various targets set out in the Vision 2010 plan, our performance over the plan period should be considered excellent. In only one area, philanthropic gifts, did our performance not reach at least 89 per cent of target. Furthermore, we exceeded our graduate enrolment, undergraduate admissions and staff complement targets.

At the core of the Vision 2010 plan was a commitment to people: the excellent students, faculty, and staff who were already part of the Waterloo Engineering community and those we would attract over the plan's five years. We envisioned significant increases to our faculty and staff complement, graduate enrolment, and research activities along with modest strategic growth in our undergraduate program. Our vision was not simply to become bigger, but to grow strategically in areas that would most enhance the overall quality of our educational and research programs. Now, at the end of the plan period, I am very pleased to note that we have achieved much of that strategic growth. And we are not simply bigger; we are indeed better. We have unquestionably raised the bar for quality across the faculty, a truly remarkable achievement given how high that bar already was at the outset of the Vision 2010 plan.

Despite a hiring slowdown necessitated by the global economic downturn, we reached 89 per cent of our faculty complement target and 105 per cent of our staff target. As of May 1, 2010, the Waterloo Engineering faculty complement stands at 260, a 24 per cent increase over the Vision 2010 baseline. These additional faculty members are contributing to our research portfolio, increasing our capacity for excellent graduate programs and enhancing undergraduate teaching. Staff hiring has slightly outpaced faculty increases, resulting in a small increase in the staff-to-faculty ratio across the faculty.

A key strategic decision in the Vision 2010 plan was to limit undergraduate enrolment increases in order to ensure that our faculty hiring program resulted in a lower student-to-faculty ratio. Widely recognized as an indicator of undergraduate program quality, this ratio decreased by 4 per cent over the plan period, reaching 17.3 undergraduate students per regular faculty member in 2009/10.

To further enhance quality in our already very strong undergraduate program, we planned for this moderate growth to be targeted to two strategic areas: the introduction of an innovative program in management engineering, and increased international undergraduate student admissions. By all accounts the management engineering program has proven successful in its early years, and I am very pleased to report that in fall 2009, the international proportion of our undergraduate student body was 6 per cent, a 142 per cent increase over the Vision 2010 baseline. Our internationalization efforts have been further enhanced through our participation in the new UW-UAE campus in Dubai. In September, 2009 a first cohort of 23 students began this unique program, whereby students study chemical or civil engineering for two years in the United Arab Emirates then come to Waterloo to complete their studies.

Despite a very challenging economic climate and the need for more than 1,000 additional work term jobs annually, the Waterloo Engineering co-op employment rate has decreased by less than one percentage point over the plan period, remaining very strong at 96.7 per cent in 2009/10. This achievement speaks to the calibre of our students, the co-operative education program we offer, and the excellent work of staff and faculty who are engaged in identifying and providing student employment opportunities.

Throughout the plan period, we have made significant strategic investments aimed at further improving the quality, impact, and visibility of our graduate studies and research portfolios. These investments aimed to move us from a position among the leading Canadian engineering schools to a level commensurate with the top engineering schools in North America. In addition to the research and graduate program contributions made by new faculty members, we have also invested in graduate recruitment, provided enhanced research services to faculty members, and supported the development of interdisciplinary research groups in areas of strength such as the Waterloo Centre for Automotive Research, Waterloo Institute for Sustainable Energy, Waterloo Institute for Nanotechnology and Centre for Control of Emerging Contaminants.

I am very pleased to note that over the Vision 2010 plan period, we have increased graduate enrolment by 54 per cent. Furthermore, graduate students now comprise almost one-quarter of the total Waterloo Engineering student population, up from 19 per cent in 2005. A significant number of those additional students are Canadians and permanent residents, successfully meeting a goal shared by the government, the university and the faculty.

The additional graduate students and faculty members who have joined Waterloo Engineering over the plan period have unquestionably made significant research contributions: in 2009/10, Waterloo Engineering earned over $51 million in sponsored research funding, an increase of 82 per cent over the plan baseline. It is important to note that this increase isn't simply due to our growing faculty complement; the ratio of research funding per faculty member, widely considered a good indicator of research intensity, also increased over the plan period, rising by 52 per cent to over $220,000 in 2009/10.

Perhaps the most visible sign of the achievement of our Vision 2010 goals is Engineering 5, our newest engineering building which will open on time and on budget in October 2010. At the outset of Vision 2010, it was apparent that space constraints could impede the strategic growth outlined in the plan. I am very pleased to report that efforts to address this pressing resource gap are well under way. An external consultant engaged to conduct a thorough needs analysis and subsequent capital plan identified a need to grow our space holdings by over 50 per cent, to reach 60,000 net assignable square metres. The resulting plan called for the construction of three more engineering buildings, in addition to the space for our nanotechnology program to be provided for in the Mike and Ophelia Lazaridis Quantum Nano Centre. With one of those new buildings set to officially open this fall and phase one of another (Engineering 6) currently under construction, we are making excellent progress toward meeting our space needs. By the end of 2011, when the buildings currently under construction are completed, our total space holdings will have increased 56 per cent over the plan baseline. While this progress is impressive, substantial efforts must continue to finalize the remaining funding for Engineering 5 and 6 and to begin construction of Engineering 7.

While the faculty has successfully capitalized on some opportunities that weren't anticipated at the outset of the Vision 2010 plan period, we have also faced unforeseen challenges related to the global economic downturn that impacted faculty hiring, fundraising, our co-operative education program and the university budget. Due to annual budget cuts over the past many years, ranging between one and three per cent, our financial situation has become increasingly constrained. In large part due to our participation in the university's revenue-sharing initiatives and our efforts to somewhat diversify our revenue sources, our budget per student ratio has increased by 23 per cent over the plan period. This figure, which does not intend to measure the money spent directly on each student, is a normalized look at the operating revenue available to the faculty and is a widely accepted measure of the overall richness of the faculty's program. Our endowment has also at least doubled over the plan period, reaching $70.5 million, or a normalized value of $11,400 per student, in 2009/10.

Overall, Waterloo Engineering has made significant progress in all areas over the past five years, following the strategic direction set out in its Vision 2010 plan. Utilizing a set of 15 key metrics and an equal number of key performance indicators, the two tables that follow highlight some of the progress made over the plan period. Further details regarding these measurements are provided in Appendix G.

We move into our next planning phase on an even stronger foundation, energized by the successes of the Vision 2010 plan period and mindful of new opportunities and challenges that lie ahead. With the continued commitment and guidance of our senior administrators on the planning committee and the excellent work of all our students, faculty, staff, alumni and other community members, we will continue to redefine excellence in engineering research and education.

Waterloo Engineering at the Conclusion of Vision 2010

Table 1: Key Metrics
Current Values and Changes over the Plan Period (2005-2010)

Key Metric	2009/10	Percent Change
1. Faculty	260	+ 24%
2. Staff	197	+ 31%
3. Undergraduate Students (FTE)	4,741	+ 18%
4. International Undergraduate Students	283	+ 171%
5. Undergraduate Degrees Granted	849	+ 4%
6. Graduate Students (FTE)	1,467	+ 54%
7. International Graduate Students	475	+ 59%
8. Graduate Degrees Granted	448	+ 54%
9. PhD Degrees Granted	96	+ 71%
10. Sponsored Research Funds ($millions)	$51	+ 82%
11. Alumni	31,754	+ 17%
12. Space Holdings, including Under Construction (nasm)	60,300	+ 56%
13. Budget ($millions)	$72	+ 53%
14. Endowment ($millions)	$70.5	
15. Vision 2010 Campaign progress to date ($millions)	$75	

Waterloo Engineering at the Conclusion of Vision 2010

Table 2: Key Performance Indicators
Current Values and Changes over the Plan Period (2005-2010)

Key Performance Indicator	2009/10	Percent Change
1. Staff/Faculty	0.76	+ 4%
2. Undergraduate Students/Faculty	17.3	- 4%
3. International Undergraduates/Total Undergraduates	0.06	+ 142%
4. Undergraduate Degrees Granted/Faculty	3.3	- 16%
5. Graduate Students/Faculty	6.3	+ 30%
6. Research Graduate Students/Faculty	4.6	+ 12%
7. International Graduate Students/Total Graduate Students	0.32	+ 3%
8. Graduate Degrees Granted/Faculty	1.8	+ 26%
9. PhD Degrees Granted/Faculty	0.4	+ 40%
10. Graduate Students/Total Students	0.24	+ 24%
11. Sponsored Research Funds/Faculty	$220,100	+ 52%
12. Sponsored Research Funds/Budget	0.75	+ 21%
13. Space Holdings including Under Construction (nasm)/Student	10.6	+ 27%
14. Budget/Student	$11,600	+ 23%
15. Endowment/Student	$11,400	

II FINAL REPORT

From 2004 to 2006, Waterloo Engineering engaged in a thorough and comprehensive planning process. Each of the faculty's units developed a self study and a draft plan. The plans were then subjected to the scrutiny of external reviewers and were revised to take the reviewers' input into account. The faculty's overall plan was also critiqued by three external reviewers. The final document, *Vision 2010: A Blueprint for Excellence in Engineering Education and Research*, was published in May 2006. It included a set of goals and strategies aimed at achieving the faculty's aspiration of becoming widely recognized as Canada's premier engineering school and counted among the leading schools of engineering in North America.

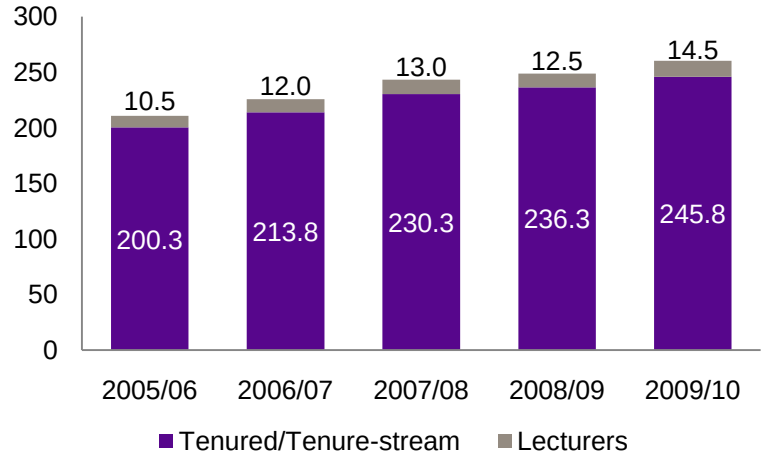
The Vision 2010 plan envisioned a process of annual assessment of the status of Waterloo Engineering and a report on progress toward implementing its plans. It was expected that this annual review process would provide an opportunity for the individual units to critically examine their plans and propose changes in direction as appropriate.

This is the fourth annual report on the Vision 2010 plan. As the final report on Vision 2010, it provides a view of Waterloo Engineering in the spring of 2010 and a summary of accomplishments and challenges over the plan period. The commentary in the following sections is supported by the data presented in the appendices. Each of the faculty's eight academic units has prepared a final report on its plan, a summary of which is included in Section III.

A. Faculty and Staff

As of May 1, 2010, Waterloo Engineering's regular faculty complement has reached 260.3. Of these, 245.8 are tenured/tenure-stream faculty members and 14.2 per cent are women. Engineering faculty members account for just over one-quarter of the University of Waterloo faculty complement.

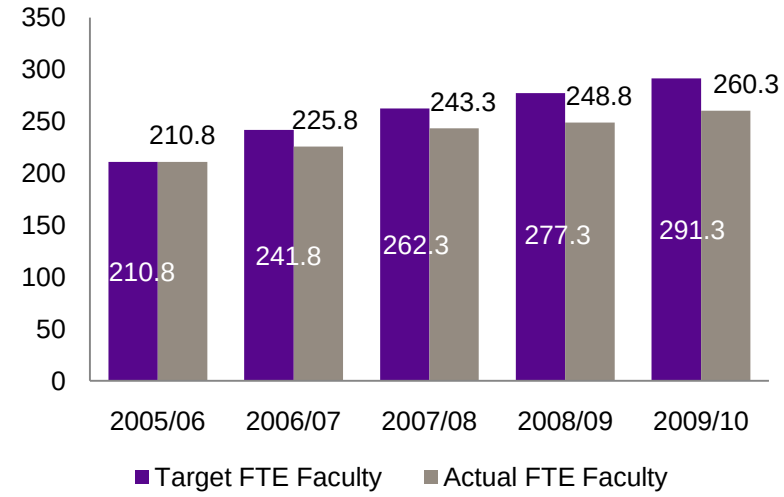
Figure 1: Regular Faculty, 2005/06-2009/10



Over the Vision 2010 plan period, 74.5 faculty members were hired and 25 departed, resulting in a very significant 23.5 per cent increase to the faculty complement. This investment in people has been a foundation of the Vision 2010 plan. At the plan's outset, we aimed to hire 80 additional faculty members to contribute to our research portfolio, further increase our capacity to provide excellent graduate programs, and reduce student-to-faculty ratios in our undergraduate program.

At the end of the Vision 2010 plan period, we have hired 93 per cent of the new faculty projected in our original plan. After open positions resulting from departures are accounted for, the total faculty complement is currently at 89.4 per cent of target.

Figure 2: Regular Faculty, Performance to Target



Although we still expect to ultimately reach our faculty complement goal, doing so will extend beyond the original 2009/10 timeline. In the early years, some faculty hiring was deliberately slowed in order to focus financial priorities on addressing severe space constraints and supporting new graduate students. In recent years, the global economic downturn has resulted in a need for additional fiscal restraint on the part of the university and the faculty. An institutional hiring freeze implemented in fall 2008 slowed the pace of some faculty recruitment by limiting new hires to only those positions deemed mission critical. Given these extenuating factors, we have made excellent progress toward our ultimate faculty goals over the past five years.

It is also important to note that faculty recruitment efforts are actively continuing across Engineering. An additional 13 faculty members who will arrive on campus after May 1 have been hired, and four faculty members are expected to depart after May 1. At the time of publishing this report, Waterloo Engineering's regular complement has reached 269.3 faculty members, of whom 254.8 hold tenured/tenure-stream positions.

Over the plan period, new faculty have been hired strategically and at varied levels, including some mid-career and senior faculty members to ensure balance and anchor new areas. Efforts to hire graduates from a wide diversity of schools and to limit hiring of Waterloo PhDs without post-doctoral experience elsewhere have been very successful. Only 4 per cent of all new hires have a PhD from Waterloo and 67 per cent earned their doctorates outside of Canada. This diversity brings a wealth of perspectives to the faculty's teaching and research activities.

Figure 3: Tenured/Tenure-stream Faculty Hired 2005/06-2009/10, by PhD

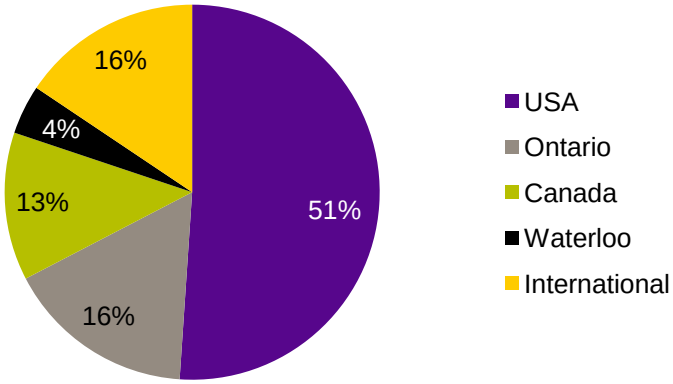
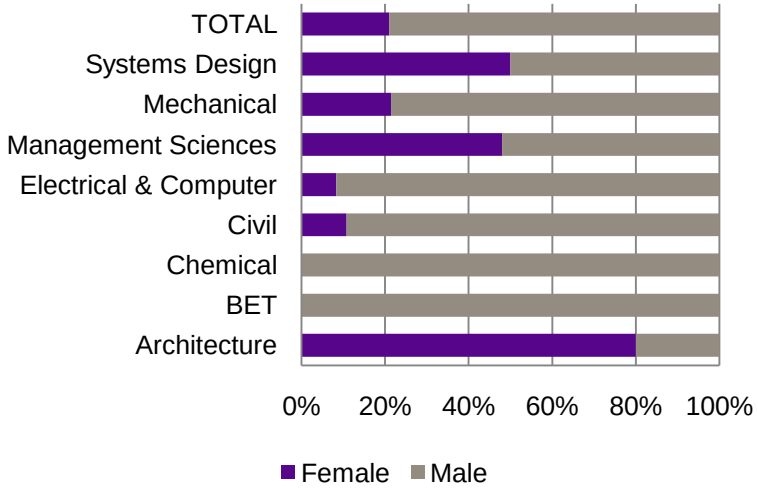


Figure 4: Tenured/Tenure-stream Faculty Hired 2005/06-2009/10, by Gender



In response to recommendations from the Vision 2010 task force on faculty issues, Waterloo Engineering has enhanced the support it provides to new faculty members. The fifth annual engineering-specific orientation session for new faculty members will be offered this fall, and engineering's recruitment and publications co-ordinator works with the university's new faculty recruitment and support office to assist prospective and new faculty members in their transition to Waterloo Engineering. Most departments have also developed mentorship programs to help with the integration of new colleagues.

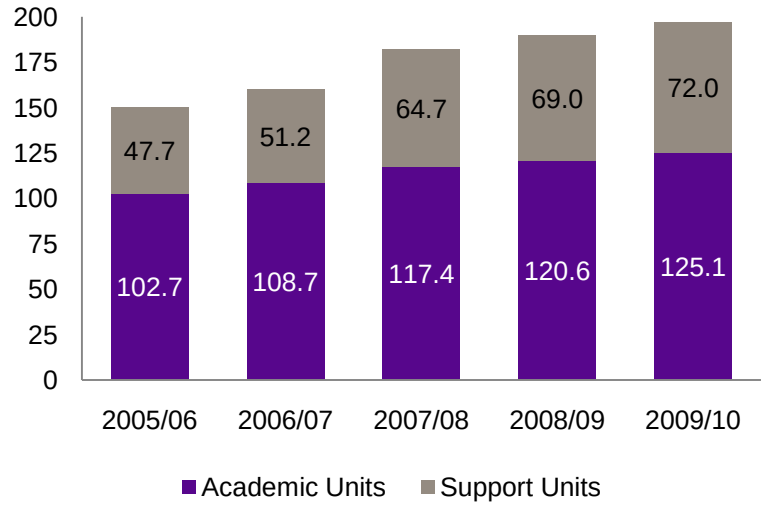
The office of the associate dean, co-operative education and professional affairs also provides an important service to new and existing faculty, assisting with the preparation of licensure applications, advising on the preparation of documents, and offering preparatory workshops for instructors who have registered to write the Professional Practice Exam. Over the plan period, the total number of licensed faculty has increased in every department; however, there has only been a modest increase in most departments in the fraction of faculty that is licensed. Currently, once those faculty members who are progressing toward licensure have completed the process, four of the six engineering departments will have more than 70 per cent of their faculty licensed.

Waterloo Engineering's current and former professoriate includes numerous prestigious award winners, including three Order of Canada recipients, 14 Fellows of the Royal Society of Canada, 24 Fellows of the Canadian Academy of Engineering, 10 Fellows of the Engineering Institute of Canada, two Premier's Catalyst Award recipients and three individuals included among Canada's Top 40 Under 40. The faculty awards and honours committee, formed in response to a Vision 2010 goal, continues its work to seek recognition for our very deserving faculty members. To further recognize faculty excellence, we have introduced research awards to complement the existing faculty teaching awards. A list of selected honours awarded to our faculty members in 2009 is included in the faculty data appendix. In recent years, an online listing has also been developed to celebrate those faculty members who have won prestigious awards.

In addition to faculty growth, the Vision 2010 plan also outlined plans to increase staffing levels. Through the strategic hiring of staff members, we aimed to support the additional activities outlined in the pan and to ensure that all our faculty members, students and programs were provided the excellent level of professional support required to ensure ongoing quality across all areas of the faculty.

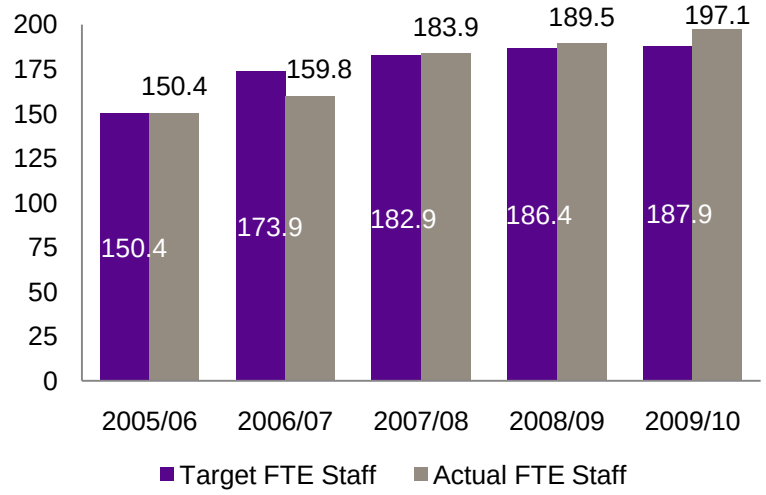
As of October 1, 2009, Waterloo Engineering had 197 full-time equivalent staff members funded from the operating budget. Of these, 125 work in academic units and the remainder are engaged in faculty-wide support areas. A large number of additional staff members, paid by funds outside of operating (such as research grants), are also actively engaged in the life of the faculty.

Figure 5: FTE Staff, 2005/06-2009/10



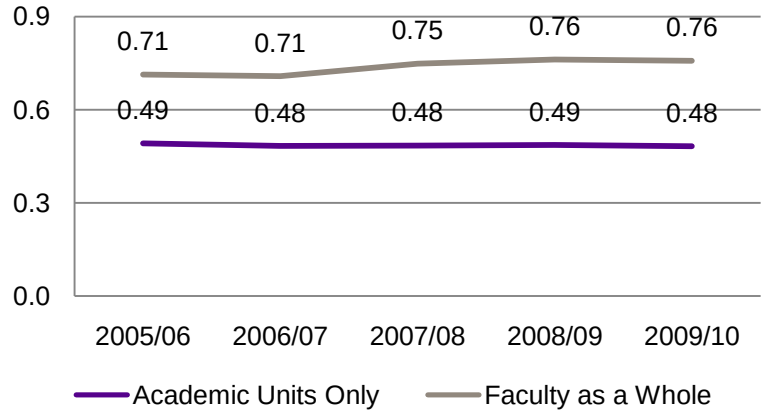
Our current staff count represents almost 105 per cent of the original Vision 2010 goal. At the plan's outset, we aimed to create 37 new full-time equivalent staff positions. This figure did not include staff projections for the PDEng program, which was being phased in at the time. The over-target performance in staff growth reflects, in large part, the additional staff hired to operate the PDEng program in steady state.

Figure 6: FTE Staff, Performance to Target



The Vision 2010 plan aimed to ensure appropriate staffing levels commensurate with its faculty hiring goals. The current staff-to-faculty ratio is a good indicator that such an appropriate level has been achieved, as this ratio for academic units has remained stable over the plan period despite increases to the faculty complement. Increases in this ratio for the faculty as a whole reflect steady-state staffing for the PDEng program and increases to staffing in other strategic faculty-wide areas, such as research and external relations.

Figure 7: FTE Staff per Regular Faculty Member



The Dean's Staff Advisory Committee (DSAC), which was created in response to recommendations of the Vision 2010 task force on staff issues, is committed to ensuring an environment conducive to staff satisfaction and success. Engineering staff members are represented on Engineering Faculty Council by four DSAC members, and the group has been working with the dean to address such issues as job training, professional development and staff recognition.

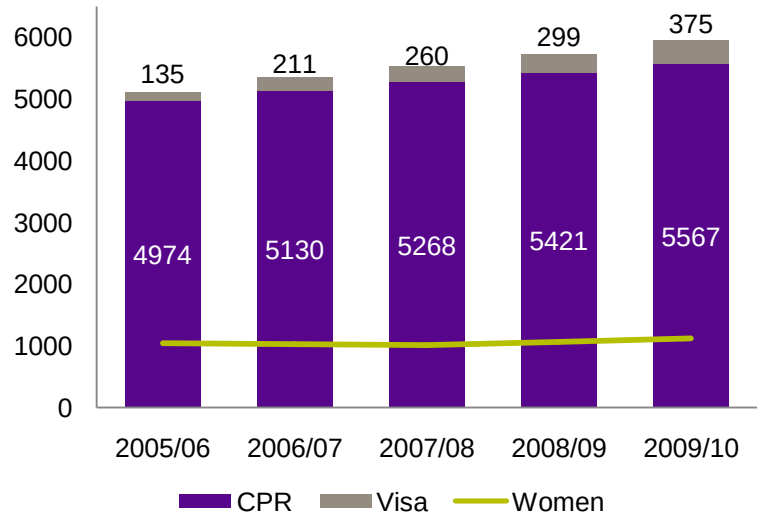
In October 2009, Waterloo Engineering awarded its third annual outstanding staff awards, an honour established under DSAC's leadership in 2007, to Liz Bevan of chemical engineering and Fred Bakker of the engineering machine shop. A list of recipients since this award's inception is included in the faculty and staff data appendix.

B. Undergraduate Studies

To fully capitalize on the quality improvement opportunities inherent in Vision 2010 faculty growth, undergraduate enrolment increases have been moderate and targeted in strategic areas. Continuing our important work in undergraduate program innovation – by which Waterloo Engineering introduced exceptional collaborative programs in software (2001), mechatronics (2003) and nanotechnology (2005) engineering – a new program in management engineering was introduced in 2007. And in recognition of the increasingly global nature of the engineering profession and the global aspirations of the university's Sixth Decade plan, we aimed to increase international undergraduate enrolment to reach approximately 8 per cent of the first-year class by 2010.

In fall 2009, a total of 5,942 undergraduate students were enrolled in Waterloo Engineering. Due to our co-op program, through which all undergraduate students alternate work and school terms, a proportion of Waterloo Engineering undergraduates are only in class for one out of the three terms in an academic year. To account for this phenomenon, we also calculate an annual full-time equivalent (FTE) undergraduate enrolment, which for 2009/10 was 4,741. Engineering students account for 22 per cent of all undergraduates enrolled at the University of Waterloo in fall 2009, and 19 per cent of the 2009/10 FTE enrolment.

Figure 8: Undergraduate Enrolment, 2005/06-2009/10

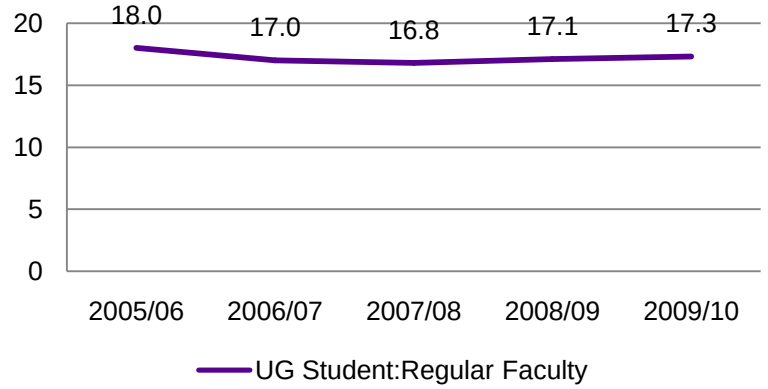


Undergraduate enrolment increased by approximately 16 per cent over the plan period. A significant proportion of this increase results from the new programs introduced in recent years, all but one of which (the newest, management engineering) have now reached steady state. Management engineering was successfully introduced in 2007 and continues to attract quality students, including a high proportion of women and international students. Another focused area of growth has been in international admissions. Over the plan period, the international student share of our undergraduate body has increased from 2.5 per cent to over 6 per cent.

The Vision 2010 plan also called for careful attention to the recruitment of women. In 2008, Waterloo was second in Ontario and fifth in Canada in the total number of women enrolled in accredited engineering programs; Waterloo was home to 29 per cent of all women enrolled in engineering programs in Ontario and 11.5 per cent of all women enrolled in engineering nationally. Over the plan period, the total number of women enrolled in Waterloo Engineering programs has increased by 80.

However, as a percentage of the undergraduate body, female enrolment has decreased, reflecting a national downward trend. Our associate dean for outreach, undergraduate recruitment co-ordinator, director of admissions and Women in Engineering Committee all continue to pay close attention to this situation. To ensure Waterloo Engineering is attracting its share of female undergraduates, additional initiatives aimed at women, including a new event for female applicants, were introduced for the 2010 recruitment cycle. Further details on Waterloo Engineering's women in engineering initiatives are outlined in the outreach section of this report.

Figure 9: Undergraduate Students per Regular Faculty Member

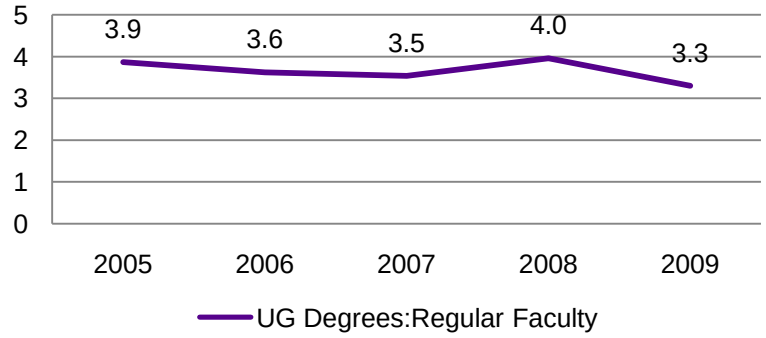


Widely recognized as an indicator of the quality of undergraduate education, our ratio of undergraduate FTE students to regular faculty has decreased by 4 per cent. This is an excellent outcome, especially given that our faculty growth has been slower than anticipated. The current Waterloo Engineering ratio of 17 compares very favorably to the university-wide ratio of 25. Another widely-cited institutional figure is the total student to faculty ratio, which includes graduate students as well as undergraduates. For 2009/10, the university total student to faculty ratio is 29; the equivalent Waterloo Engineering ratio is 23.5.

Reflecting the phase-in of our newest programs, the total number of degrees granted to undergraduates has increased by 4 per cent over the plan period. A decline in degrees granted between 2008 and 2009 has been noted and merits further study by our undergraduate office. In 2009, 20 per cent of undergraduate degrees granted by the University of Waterloo were to engineering students. While degrees granted to women have decreased over the plan period, reflecting decreases in the enrolment of women, degrees granted to visa students have increased from zero to 3 per cent. This number should continue to rise as we enroll more international students; however, it is not expected to keep pace with the rate of international student admissions growth, as some visa students will become Canadian citizens or permanent residents over the course of their studies. The number of undergraduate degrees granted per regular faculty member has decreased by 15 per cent, further indicating that increases to our faculty complement have positively influenced undergraduate student ratios.

Figure 10: Undergraduate Degrees Granted

Figure 11: Undergraduate Degrees Granted per Regular Faculty Member



In fall 2009, we exceeded our overall undergraduate admissions target by 4 per cent and our international admissions target by 22 per cent. We also exceeded our international student goal of 8 per cent of the incoming class, reaching just over 10 per cent. This over-target performance includes 23 students enrolled in the first year of chemical and civil engineering programs offered at the new UW-UAE campus in Dubai, United Arab Emirates. Over the plan period, admissions have increased by 11 per cent while the international group within this total has increased by 111 per cent. Engineering undergraduates now account for 16 per cent of visa students across the university.

Perhaps most significant among new undergraduate initiatives undertaken over the plan period is the UW-UAE campus. Waterloo Engineering now offers chemical and civil engineering programs in which students will study for two years at the campus in Dubai then complete their programs at the main campus in Waterloo. A very successful first class of 23 UW-UAE engineering students started in fall 2009. We will build on this initial success, attending to student and faculty support and continuing targeted recruitment efforts. We aim to increase UW-UAE engineering enrolment over time to reach our steady-state annual admissions target of 130 students.

Figure 12: Undergraduate Admissions, Performance to Target

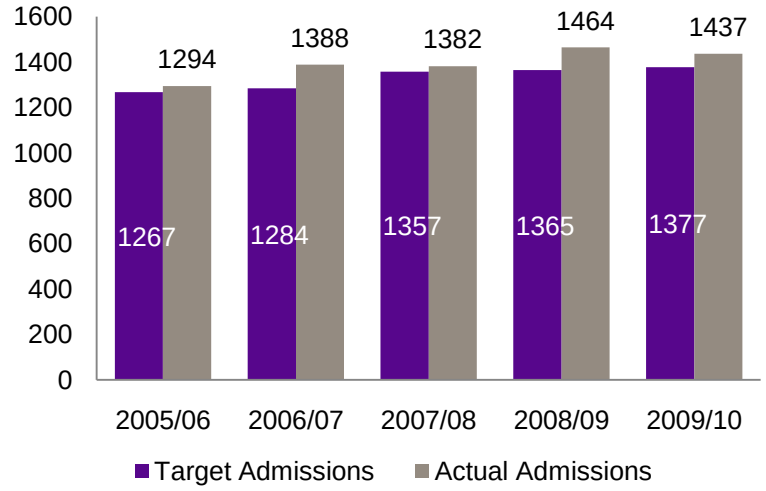
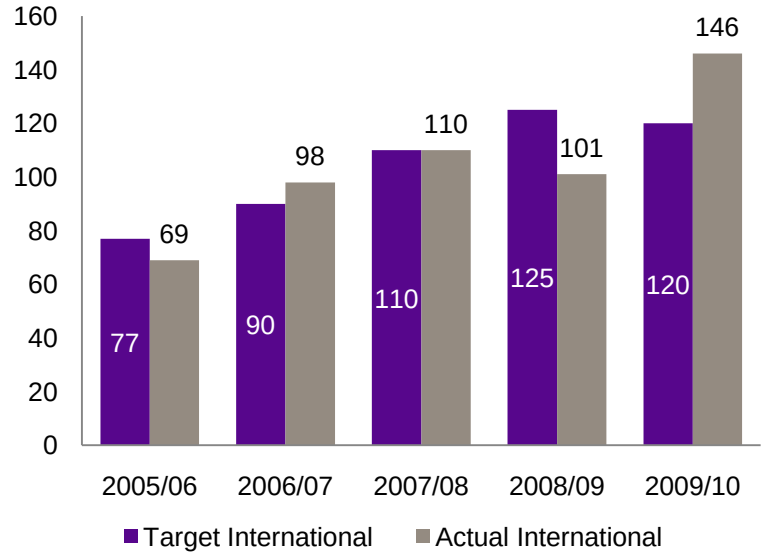


Figure 13: International Undergraduate Admissions, Performance to Target



As a whole, we have very successfully met and exceeded our Vision 2010 undergraduate targets. We continue to experience strong enrolment levels in our newest programs, which are proving to meet the needs of students and the profession. We have also realized our goal to significantly enhance international student participation in the Waterloo Engineering undergraduate program.

While exceeding our undergraduate admissions targets, indicators suggest we have also successfully enrolled the best possible students in our undergraduate programs throughout the plan period. The traditionally high grade averages of our entering students have remained stable over the plan period, ranging from the high eighties to low nineties. The percentage of students entering with averages over 90 and 95 per cent have both increased by over two percentage points over the plan period. However, it is interesting to note that the acceptance rates of offers made to students in these grade ranges have decreased over the plan period. Early indicators would suggest that this decline may be addressed in

part by a number of additional confirmation strategies introduced by the admissions and recruitment team during the 2010 recruitment cycle.

Figure 14: Entering Students with Averages >=90% and >=95%

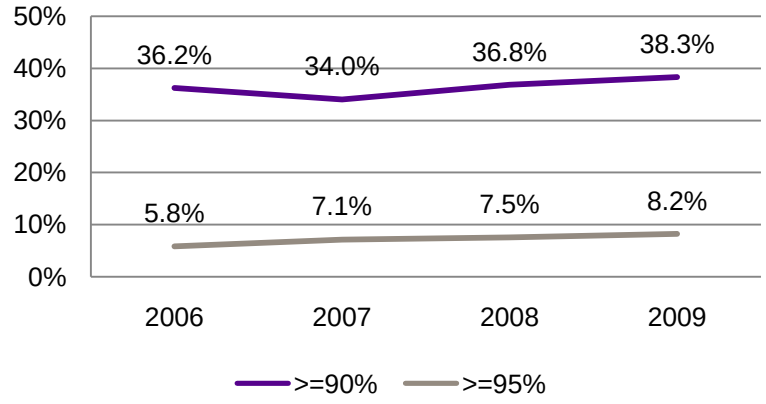
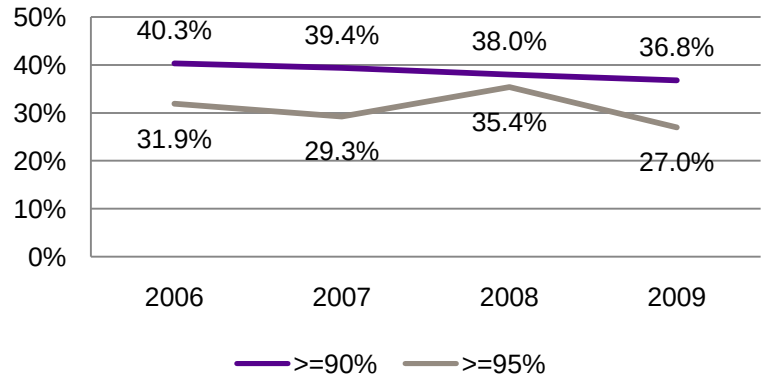


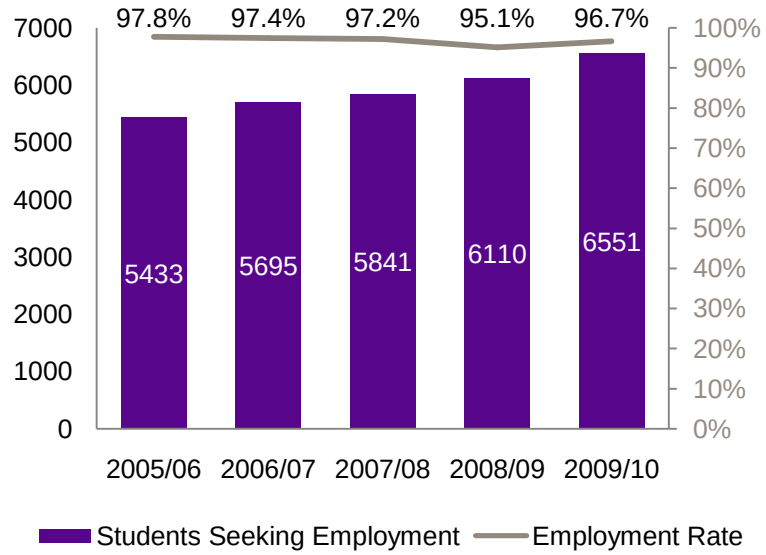
Figure 15: Offer Acceptance Rates for Students with Averages >=90% and >=95%



As our undergraduate enrolment increases, so does the number of co-op work terms required to provide our students the quality co-op experience that is central to a Waterloo Engineering undergraduate education. The number of students seeking employment increased 21 per cent over the plan period. Of the 6,589 co-op positions sought by Waterloo Engineering students in 2009, 6,340 were secured. Employment rates have remained consistently high over the plan period. The economic downturn of 2008, which was expected to have serious implications for jobs in 2009, was partially compensated for by internal job creation funding from the faculty and the university in 2009.

Co-operative education also provides excellent international opportunities to our students. In 2009, 10 per cent of work term jobs were located outside of Canada. From 2006 to 2009, an annual average of 12 per cent of work terms were international.

Figure 16: Co-op Employment Trends



An ongoing challenge for the co-op process continues to be the relative difficulty of securing job opportunities for first-year students. The associate dean, co-operative education and professional affairs continues to work with the Co-op Working Group and co-operative education and career services to address this and other matters. During the plan period, the Co-op Working Group has established guidelines for engineering jobs and has begun exploring interest in extended-duration work terms.

Waterloo Engineering's excellent undergraduate program and the co-op system of study are foundations of the faculty's high standing and national and international reputation. The Vision 2010 plan committed to continuing to build this foundation. Over the plan period, engineering planning committee members have received and acted on reports from the institutional review of co-operative education, the first-year engineering performance task force, the PDEng external review and the PDEng internal renewal task force.

The first-year engineering performance task force report *Engineering Education for Enduring Success* made 25 recommendations, many of which address the increasingly important issue of retention. A First-year Council has been established and is working toward implementing the various recommendations, which envision changes to the way Waterloo Engineering teaches and assesses students in first year and changes to the structure and organization of the engineering first-year office and services.

As outlined in the Vision 2010 plan, a full review of the Professional Development for Engineering Students (PDEng) program was conducted once the program was fully phased in. Following the external review, an engineering task force was struck with a mandate to recommend renewal of the PDEng program. The task force's goals were to improve student experience, strengthen the connection between the professional development program and the faculty, and create the best program possible to support students acquiring the professional skills required for success in today's workplace. The recommendations of this task force have been accepted and a resulting new program, WatPD - Engineering, is being introduced.

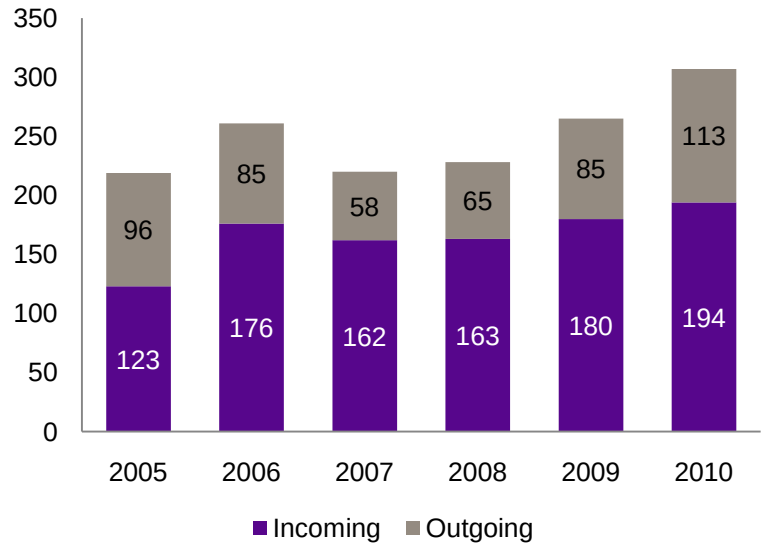
In the near future, the undergraduate administration must turn its attention to addressing the monitoring process required by the University Undergraduate Degree Level Expectations and implementing new Canadian Engineering Accreditation Board rules, which include movement toward outcomes-based

assessment (to be fully implemented by 2014) and increased expectations for the fraction of engineering design and science courses taught by registered professional engineers.

To further enhance the undergraduate student experience, our student relations officer (a position created in 2007) works closely with the dean to support the Engineering Society, orientation leaders, student design teams and other students engaged in co-curricular activities. Students are represented on a variety of committees at the faculty and university levels, such as Engineering Faculty Council and the Task Force on PDEng Renewal. Individual faculty members also connect undergraduate students with their research portfolios, most commonly through the University Research Award program. In 2009, 145 undergraduate students received URAs.

The engineering exchange program remains a strong contributor to student life and internationalization. No other Canadian engineering school has an exchange program that nears the size and scope of the opportunities offered at Waterloo. Over the plan period, 10 additional exchange programs have been created, bringing the total to 64. The Vision 2010 plan aimed for 15 per cent of a student cohort to participate in exchange annually. Assuming a cohort of 1,300 students, incoming student activity has reached target; however, outgoing student participation has only reached approximately 58 per cent of target. In recent years, the number of outgoing students participating in exchange has increased. This is due in part to additional engagement and advertisement activities implemented by the engineering exchange office. The number of incoming exchange students has increased by more than 70 students annually over the plan period.

Figure 17: Engineering Exchange Activity



C. Graduate Studies

A key goal of the Vision 2010 plan was to elevate the size, quality and reputation of the graduate program to a level commensurate with leading research-intensive engineering schools. By all measures, the graduate studies goals and objectives established in the Vision 2010 plan have been met or surpassed. We set an ambitious goal to increase graduate enrolment by approximately 50 per cent. To meet a key priority shared by the provincial government, the university, and the faculty, about two-thirds of the anticipated student enrolment growth was to be comprised of Canadians and

permanent residents. We aimed to ensure we offer graduate programs of the highest quality to excellent students across the faculty.

In fall 2009, Waterloo Engineering's FTE graduate enrolment was 1,467 students excluding those enrolled in diploma and certificate programs. This represents a 54 per cent increase over the plan baseline and 102 per cent of our Vision 2010 graduate enrolment goal. Our target for enrolment of Canadian and permanent resident students was also met, with an increase of 52 per cent over 2005/06.

Enrolment in PhD and research master programs each increased by 37 per cent; both narrowly missed their Vision 2010 targets. Professional master enrolment has shown remarkable growth over the plan period, increasing by 163 per cent over five years and reaching 130 per cent of target. Enrolment in diploma and certificate programs, for which targets weren't set in the Vision 2010 plan, has also experienced very notable growth in recent years.

Figure 18: Graduate FTE Enrolment, Performance to Target

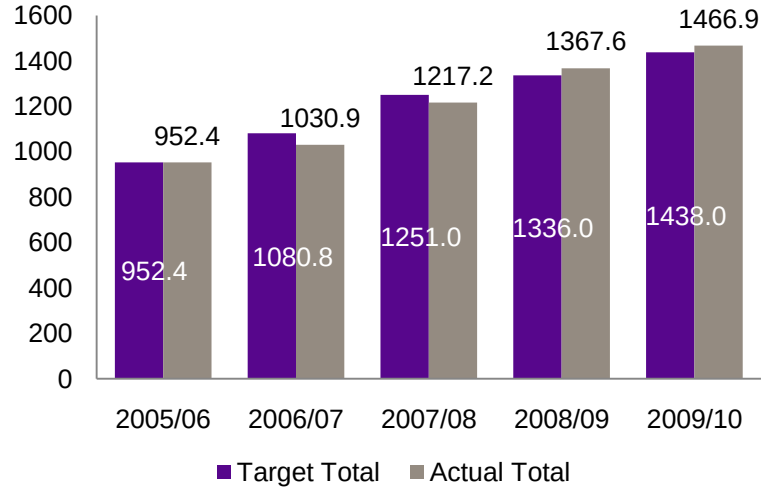
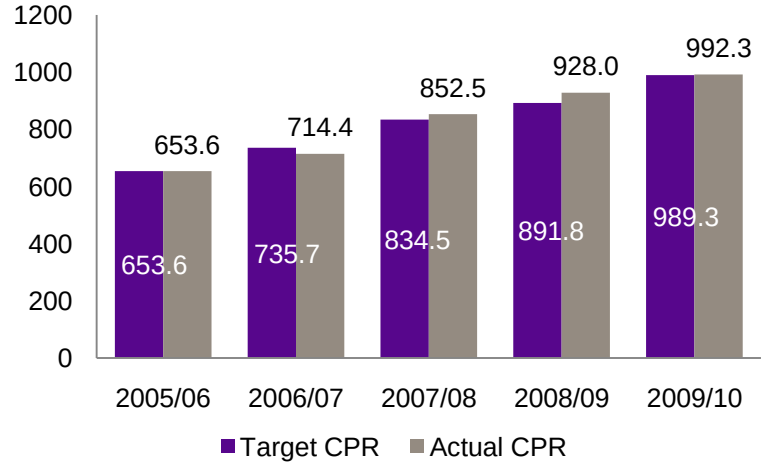


Figure 19: CPR Graduate FTE Enrolment, Performance to Target



The Vision 2010 goals set for graduate growth were very ambitious, and it is a significant achievement of the plan that these goals have been met. It is even more impressive given that the rate of faculty hiring has not kept pace with the growth envisioned in the plan.

Overall, including full- and part-time students, graduate enrolment in fall 2009 was 1,817 students. This represents an increase of 63 per cent over the plan period. Reflecting the strategic decision to limit undergraduate enrolment increases, coupled with significant graduate growth, the proportion of graduate students relative to Waterloo Engineering's total FTE enrolment rose from 19 to 24 per cent over the plan period.

The percentage of women enrolled in graduate programs has remained relatively stable throughout the plan period, increasing from 23 to 24 per cent. Currently, engineering students make up approximately 42 per cent of the university's graduate population, 37 per cent of doctoral enrolment and 27 per cent of female graduate enrolment. In 2008, Waterloo Engineering made up 8 per cent of the Canadian FTE engineering graduate enrolment and 9 per cent of Canadian female engineering graduate student enrolment. We also accounted for 22 per cent of the total FTE enrolment and 23.5 per cent of the female student enrolment in Ontario engineering schools.

Figure 20: Graduate Enrolment, 2005/06-2009/10

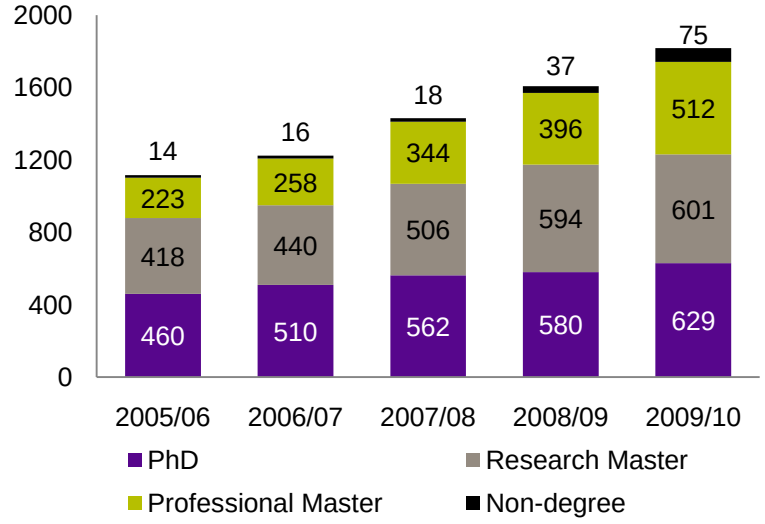
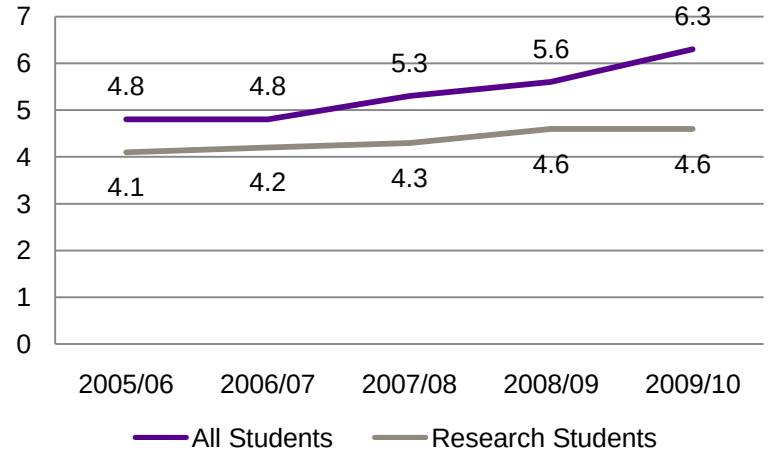
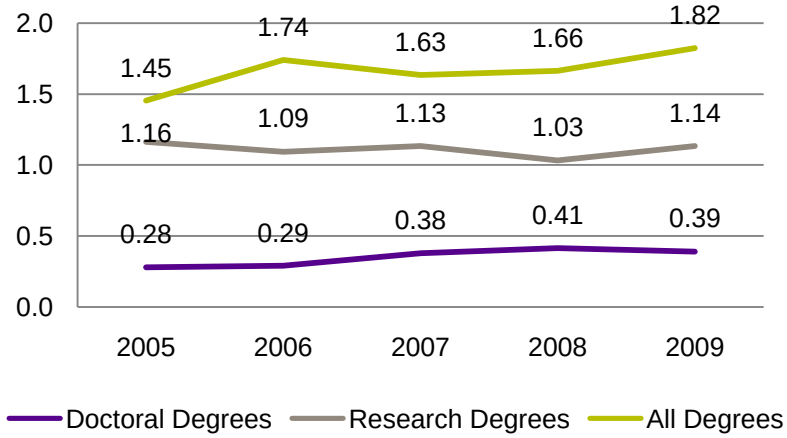


Figure 21: Graduate Students per Tenured/Tenure-stream Faculty Member



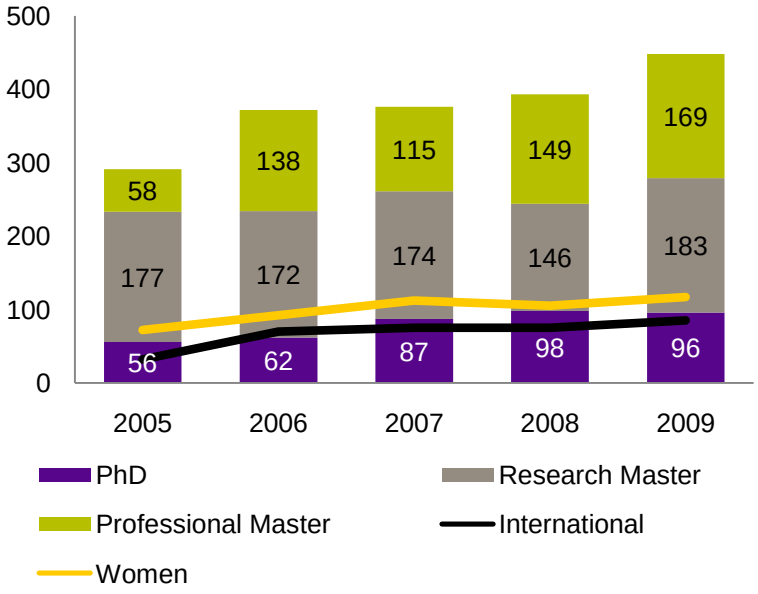
On an ongoing basis, the faculty is committed to working toward an average of five research (thesis master and PhD students) graduate students per tenured/tenure-stream faculty member. This ratio has increased by 12 per cent over the plan period, while the ratio of all graduate students per tenured/ tenure-stream faculty member has increased by 30 per cent. In 2009, the research graduate student to faculty ratio stands at 4.6. This is consistent with the higher-than-anticipated growth in professional master, certificate and diploma enrolment. Similarly, the number of graduate degrees granted per tenured/tenure-stream faculty also increased over the plan period, by 25 per cent overall and by 40 percent at the doctoral level, reaching 1.8 and 0.4 respectively.

Figure 22: Graduate Degrees Granted per Tenured/Tenure-stream Faculty Member



In 2009, Waterloo Engineering granted 448 graduate degrees, 96 of which were PhDs. This represents a 54 per cent increase in graduate degrees and a remarkable 71 per cent increase in doctoral degrees granted over the plan period. The share of graduate degrees granted to women also increased slightly, from 25 to 27.5 per cent. In 2009, 36 per cent of the graduate degrees granted by the University of Waterloo were to engineering students. In 2008, Waterloo ranked second in Canada in the number of engineering PhD degrees granted, and first for the number granted to women. In terms of master's degrees in engineering, Waterloo Engineering ranked fourth nationally for total granted and second for master's degrees granted to women.

Figure 23: Graduate Degrees Granted



Ongoing efforts throughout the plan period have resulted in a number of enhancements to the graduate student experience at Waterloo Engineering. Positive steps have been taken to increase the number and improve the organization of graduate course offerings. Many departments now prescribe core graduate courses that are offered on an annual basis. Most departments offer some form of student orientation program to complement the annual faculty-sponsored graduate student orientation event. All departments also offer graduate student seminars, and many students (80 in 2009) are taking advantage of the university-funded travel assistantship to attend national and international conferences.

In fiscal year 2008/09, engineering doctoral student earnings from all sources averaged over $32,000. Overall average earnings per funded student in all graduate programs, excluding architecture and CBET, was over $29,000.

In 2009, a new collaborative program offering master's and PhD degrees in nanotechnology was approved by the Ontario Council for Graduate Studies. A collaborative program in Quantum Information, offering master's and doctoral degrees, was approved by OCGS in early 2010.

D. Research

The Vision 2010 plan set out ambitious targets for research performance, anticipating that the additional faculty members and graduate students joining Waterloo Engineering would create substantial opportunities in our research portfolio by joining research groups, making scholarly contributions in their fields, and expanding the impact of our research. Overall, implementation of the Vision 2010 research plan has been a definite success. Research funding has increased, multidisciplinary research centres were created, and research excellence has been recognized.

Engineering research funding increased from $28 million to $51 million over the plan period. This represents an 82 per cent increase over the plan's baseline research year, 2004/05. This impressive growth occurred despite the difficult economic climate for attracting industrial research funding that has persisted since 2008. Funding from all sectors (tri-council, federal, provincial and industry) increased

overall, although funding by sector fluctuates year over year due to the timeframes of various major funding competitions. Over the six years of the Vision 2010 plan, tri-council funding accounted for the majority (34 per cent) of funding, followed by provincial funding (26 per cent), federal non tri-council funding (17 per cent) and industrial funding (14 per cent).

Figure 24: Research Funds by Sector ($millions), 2004/05-2009/10

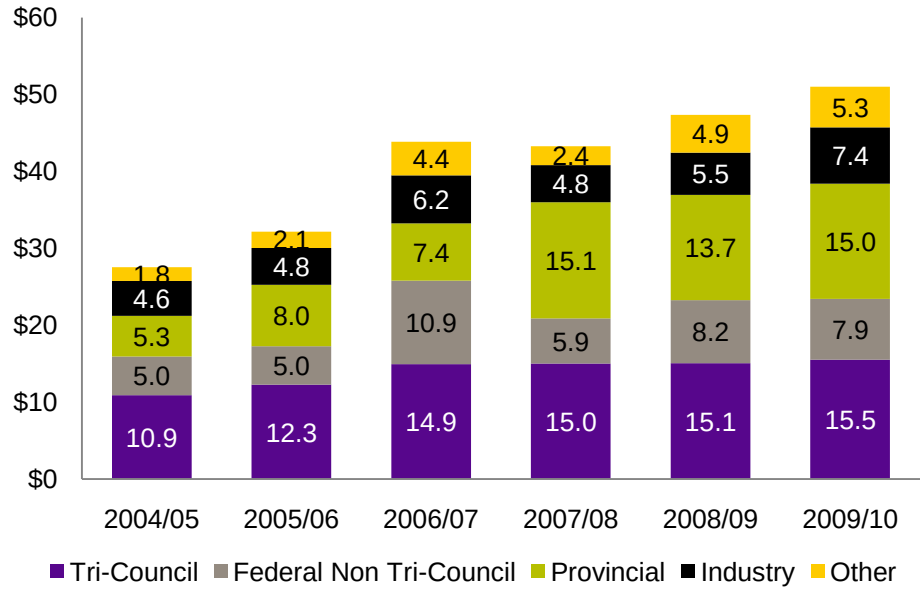
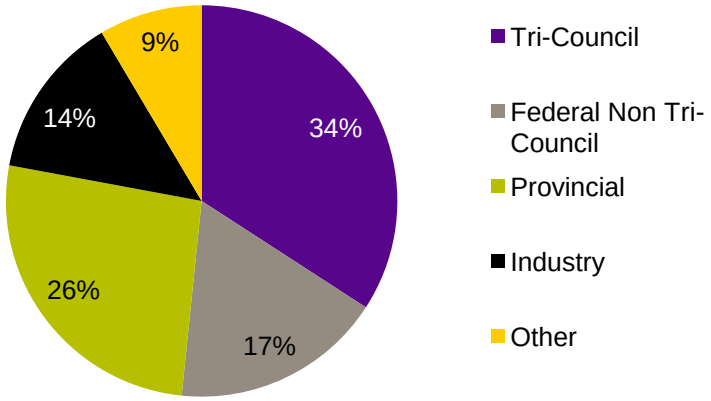
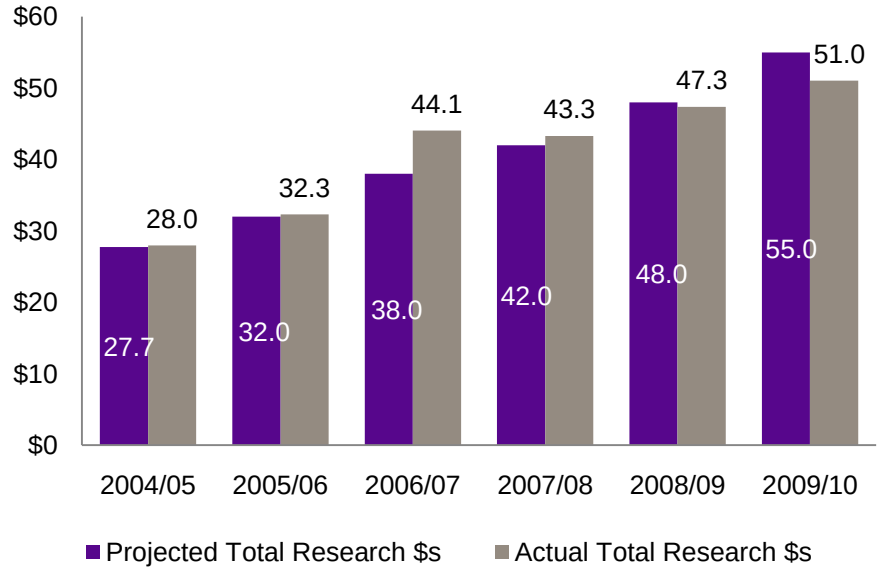


Figure 25: Research Funds by Sector, Six-year Total (2004/05-2009/10)



The Vision 2010 plan set a target to double research funding, to $55 million in 2009/10. We have reached 93 per cent of this target. It is important to note that this was achieved despite having only increased the faculty complement to 89 per cent of target.

Figure 26: Sponsored Research Funds ($millions), Performance to Target



Despite the slowdown in faculty hiring, total sponsored research funds per tenured/tenure-stream faculty member (excluding architecture and CBET) increased by 51.5 per cent over the plan period, reaching over $220,000 in 2009/10. Another indicator tracked over the plan period, the ratio of total research funding to budget, has increased by 21 per cent.

Figure 27: Average Research Funds per Tenured/Tenure-stream Faculty Member

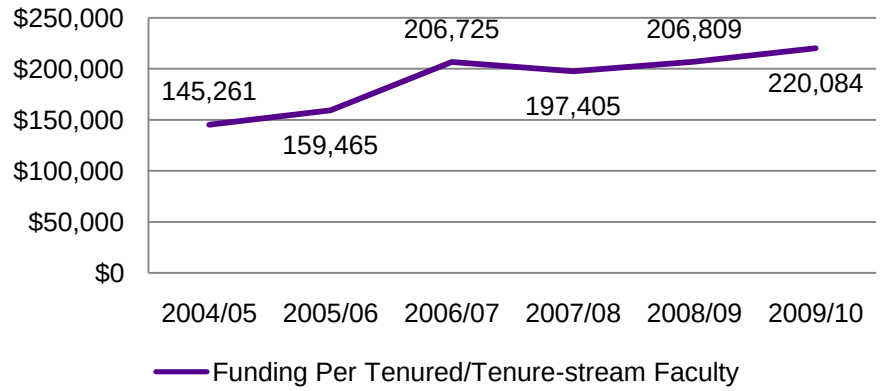
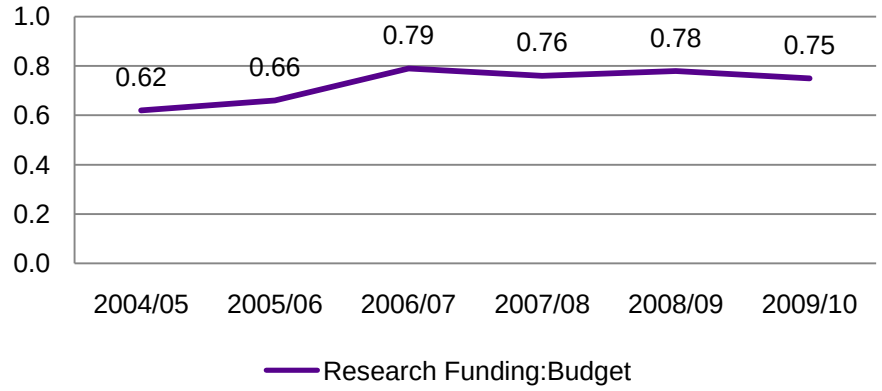


Figure 28: Ratio of Sponsored Research Funds:Budget



Over the plan period, NSERC awards granted to Waterloo Engineering researchers increased by 43 per cent, reaching almost $15 million in 2009/10. Despite this increase, analyses conducted by the Engineering Research Office suggest that Waterloo Engineering's NSERC performance in comparison with engineering faculties at our peer G13 schools bears further study in the coming years. These analyses place Waterloo sixth in overall NSERC funding to engineering departments over the plan period; from 2004/05 to 2009/10, our standing in this peer group slipped from the upper third to the middle of the group. In that six-year period, Waterloo Engineering ranks second in total RTI funding and eighth in average discovery grant. This position among our peers has been relatively stable, year-over-year, over the plan period. It will be particularly important to track discovery grant performance in the coming years as the discovery grant awards program has recently undergone a significant redesign.

The Vision 2010 plan encouraged faculty membership on tri-council Grant Selection Committees (GSC) by providing one teaching task reduction for each year that a faculty member is a member of a discovery or strategic grant GSC. In 2009, seven faculty members served on tri-council committees, a decrease from 10 in 2008.

Commercialization of research can be considered a good indicator of overall research impact. Over the last five years, IP disclosure created from Waterloo Engineering research has resulted in 97 patent applications. The university's commercialization office has helped engineering researchers obtain $1.4 million in prototype development funding for 14 projects. Several startup companies have been spun off from research results, including AEMK Systems Inc, CanGrid Engineering, CertiChip, Crez Basketball Systems, DossierView Inc, Strike Face Technology Inc, Tactile Sight Inc, Segasist Inc. (formerly OMISA), Tyromer Inc, Nanopeptide Biotechnology Inc, and Slipstream.

An important contributor to our reputation as a multi-faceted school of engineering is the recognition of researchers' excellence in provincial, national and international forums. To that end, three engineering researchers earned Ontario Early Researcher Awards in 2009, bringing the number of ERAs earned over the plan period to 16 (and 43 over the history of the PREA/ERA program). Waterloo Engineering currently has 20 Canada Research Chairs (including two open chairs), 11 NSERC Industrial Research Chairs, one NSERC Chair in Design Engineering, and two Ontario Research Chairs. The number of Canada Research Chairs and NSERC Industrial Research Chairs has increased 43 per cent and 83 per cent, respectively, over the plan period. Overall, the number of chair holders in engineering has increased by more than 90 per cent from 2006 to 2010.

At the institutional level, Rick Culham, the associate dean for research and external partnerships, is the latest recipient of a University Research Chair, bringing the number of URC holders in the faculty to nine. In response to a Vision 2010 goal, the engineering research office now administers two award programs in recognition of outstanding research by engineering faculty members. The Faculty of

Engineering Research Excellence Awards were introduced in 2009 to complement the existing teaching excellence awards. Each year three awards of $2,500 plus funding for two Undergraduate Research Assistantships are made, one at each professorial rank. In 2009 these were awarded to Karim Karim, Catherine Burns and Xianguo Li. First awarded in 2008, the En Hui Yang Research Innovation Award is an endowed award that each year recognizes an outstanding Waterloo Engineering researcher. The 2009 winner was Flora Ng.

In early 2010, Waterloo Engineering led three ORF-RE awards totalling over $11.3 million. Engineering researchers were also part of a $4.9-million ORF-RE awarded to Waterloo computer science researchers and an ORF-RE awarded to the Thunder Bay Research Institute. Waterloo Engineering researchers were also project leaders or participants in four large CFI awards in 2009 totalling over $8.3 million in new infrastructure funding.

The Vision 2010 research plan also called for additional services to be provided to new and existing faculty members to increase the impact of, and funding for, their research. The engineering research office was established to provide structured information, advice and counselling on available grants, matching and industrial contract opportunities. In the early years, the associate dean and an administrative officer provided this support. In 2009 a director of engineering research joined the office. This role provides increased capacity to develop industry partnerships, lead large funding proposals and support other faculty research initiatives.

In response to a Vision 2010 recommendation a standing research committee of Engineering Faculty Council was initially established; however, the committee no longer convenes as the associate dean's regular updates to Engineering Faculty Council have proven sufficient for communications and decision-making guidance. A research grants advisory committee also planned in the Vision 2010 document was not created. Rather, ad-hoc committees with representation from the departments and research centres have been formed when strategic planning for major grants has been required.

Another key role of the engineering research office is to assist in establishing and supporting interdisciplinary research centres in strategic areas of research strength across the faculty. In 2009, Waterloo Engineering hosted 11 active centres and institutes, including the Waterloo Centre for Automotive Research (WatCAR), Waterloo Institute for Sustainable Energy (WISE), Waterloo institute for Nanotechnology (WIN) and Centre for Control of Emerging Contaminants (CCEC).

E. Outreach

Another new opportunity recognized subsequent to publishing the Vision 2010 plan was to build on the foundation of outreach established by Engineering Science Quest (ESQ), Explorations and other programs. We recognized that, by further engaging the Waterloo Engineering population with the outside community, we could help help foster interest and understanding of engineering and build awareness of what engineers do and how they benefit society. To that end, a new associate dean portfolio was created for outreach in September 2008. The associate dean for outreach is responsible for sustaining, improving and co-ordinating the faculty's outreach activities. Women in engineering initiatives also fall under this mandate, as the promotion of engineering to girls and women is a priority.

Significant progress has already been made in the outreach portfolio. Over 9,800 youth were reached by ESQ in 2009 through workshops, clubs and summer camps. This includes 150 children in rural areas and 140 children in aboriginal communities who attended camp at ESQ satellite locations. When other community events such as UW Canada Day and Kids Spark are included, closer to 11,000 children were exposed to ESQ's excellent programming. Over 700 participants also attended the nineteenth annual Engineering Explorations open house for students in Grades 6-8 and their parents. In 2008 eight local elementary school teams participated in the First Lego League, a global program aimed at getting

children in Grades 4-8 excited about science and technology. Waterloo Engineering supported local teams through funding, providing mentors/coaches for the teams, and creating a practice tournament on campus. Two of these teams went on to compete at the provincial level. This program is set to expand dramatically next year as the Catholic school board and many individual schools have indicated substantial interest.

In conjunction with the Perimeter Institute's Quantum to Cosmos festival in October 2009, 700 high school students and their teachers visited Waterloo Engineering for a number of theme-based research sessions co-ordinated by our outreach and recruitment offices. In April 2010 a new initiative called "Designing the Future" was hosted at The Museum (formerly The Children's Museum) to showcase top undergraduate design projects to Waterloo Engineering alumni and local school groups.

The Vision 2010 task force on women in engineering made a number of recommendations aimed at expanding and improving our women in engineering initiatives. As a result of their report, a half-time administrative staff role was originally created to support and enhance the function of the Women in Engineering Committee and to better co-ordinate faculty efforts to attract, retain and reward women at all levels across Waterloo Engineering. In 2008, women in engineering initiatives were further enhanced when they became part of the new associate dean outreach portfolio.

To increase outreach to school-aged girls, in 2009 the Women in Engineering Committee, under the leadership of Professors Mary Wells, Stacey Scott and Patrick Lam, worked with ESQ to initiate a Girl Guide engineering badge day on campus. Due to the success of this program, efforts are underway to plan a similar event with other universities across Ontario. Waterloo also hosted its fifth annual Go Eng Girl event in October 2009 as part of a province-wide program aimed at encouraging girls in late elementary school and early high school to consider engineering studies and careers.

In May 2009, the Women in Engineering Committee hosted the second annual boot camp for women graduate students interested in pursuing academic careers, after having helped co-ordinate the first boot camp at Queen's University in 2008. In September 2009, a lunch was organized to welcome new female faculty, undergraduate and graduate students to Waterlo Engineering. Over 200 people participated in what was described by many as an excellent networking opportunity.

Figure 29: Women in Engineering Programs, 2009/10

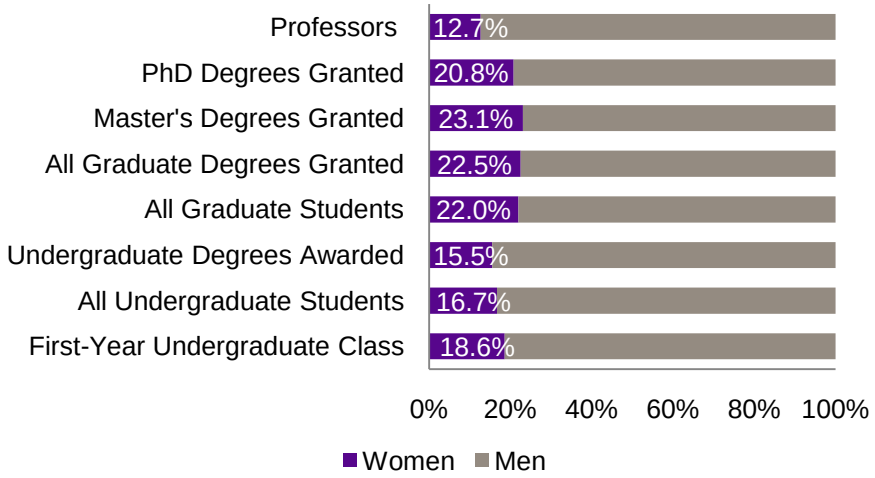
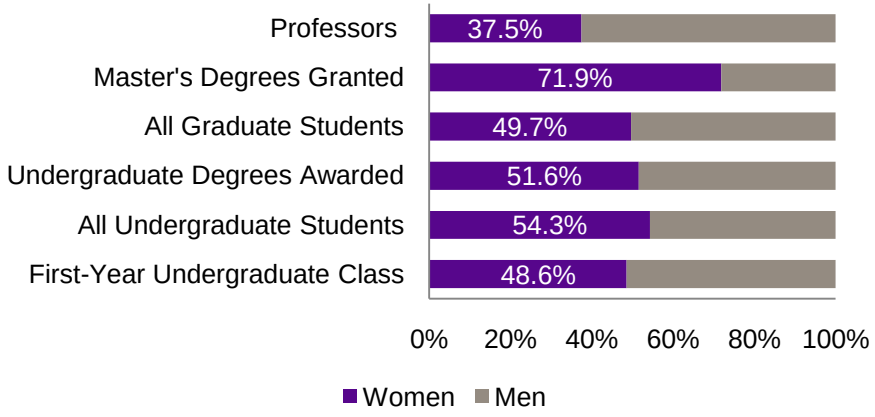


Figure 30: Women in Architecture, 2009/10



In addition to offering outreach activities targeted to girls and women, Waterloo Engineering continues to monitor the participation of women in our engineering programs. Further details on the recruitment and retention of women as well as comparisons to other institutions in Ontario and Canada are outlined in the faculty, undergraduate and graduate sections of this report.

F. External Relations

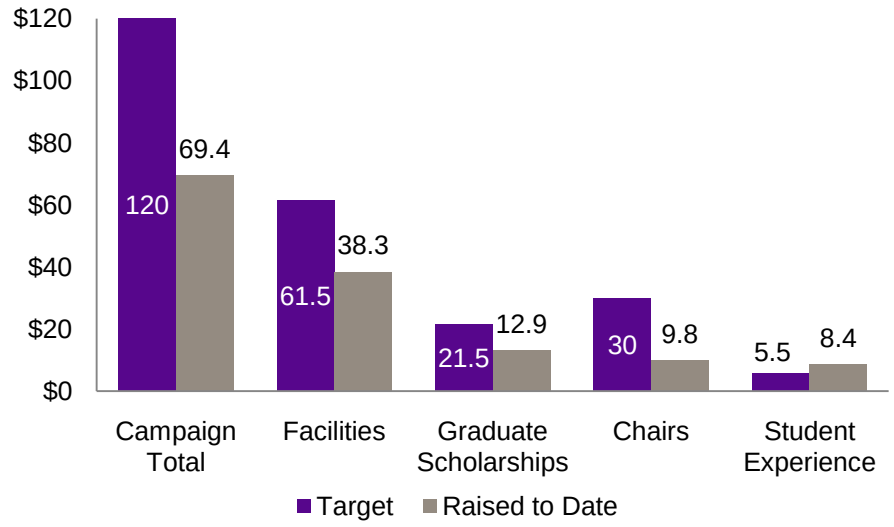
The Vision 2010 plan recognized the need to invest in external relations to support the plan. As we worked to ensure excellence in engineering education and research, we also worked to increase our visibility as a leading multi-faceted school of engineering. And we recognized that an essential source of funding for the priorities outlined in our plan would be through philanthropic gifts.

To raise the funds required to successfully implement our plans, the Vision 2010 Campaign was launched in 2007. The priorities of this campaign were closely focused to best support our academic priorities, specifically: buildings, graduate student support, research chairs and student experience. To further support development initiatives, engineering associate deans, chairs and selected faculty members have been engaged in fundraising calls and have participated in alumni events.

At the end of the 2009/10 fiscal year, we had reached 58 per cent of our overall Vision 2010 Campaign target. Since May 1, 2006 (i.e. the beginning of the Vision 2010 Campaign period), we had raised $69.4 million including pledges. We had exceeded the student experience goal, reaching 150 per cent of target. We had raised 62 per cent of our $61.5-million goal for facilities, 56 per cent of our $23-million graduate scholarship goal, and 33 per cent of our $30-million research chair goal. Ongoing fundraising efforts since June have brought our Vision 2010 total to $75 million as of September 1, 2010.

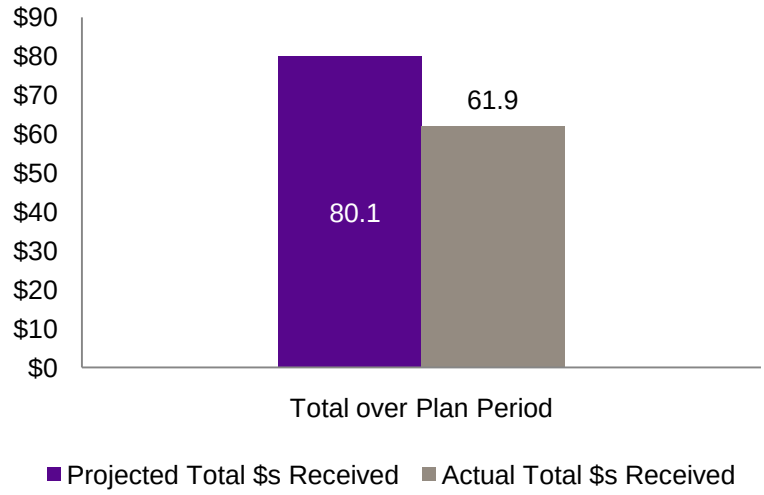
Within the Vision 2010 campaign, the faculty, staff and retiree (FSR) appeal has been particularly successful, reaching 160 per cent of its original target of $500,000. This includes $325,000 from three pacesetting gifts made early in the campaign. Not including these pacesetting gifts, the FSR campaign has reached 95 per cent of its goal to date.

Figure 31: Vision 2010 Campaign Performance to Date ($millions)



The Vision 2010 plan set year-over-year targets for philanthropic gifts received by the faculty (i.e. receipted donations, excluding outstanding pledges). Over the plan period, we reached 77 per cent of our total goal, having received almost $62 million in donations at the end of the 2009/10. Furthermore, engineering endowments have more than doubled over the plan period, reaching $70.5 million in 2009/10. This increase marks a significant contribution to the faculty's activities and student support.

Figure 32: Philanthropic Gifts Received ($millions), Performance to Target



As called for in the Vision 2010 plan, a Dean's Advisory Council was established in 2007 and has held six meetings to date. A Campaign Cabinet was also created, and the first of its seven meetings to date was held in 2008.

New Engineering alumni programs have been introduced over the plan period, including graduating class receptions and annual alumni events in Hong Kong, California and Alberta. An electronic

newsletter, E-Weal, now circulates to Engineering alumni three times annually, in addition to an annual print issue of WEAL. To further recognize our alumni and friends, the alumni achievement medal categories have been expanded to include young alumni medals and friends-of-the-faculty medals.

Significant development milestones over the plan period include the celebration of a $2.5-million gift from the Musagetes Foundation to name the architecture library, a gala event to celebrate Waterloo Engineering's fiftieth anniversary, a $25-million gift received for nanotechnology (the largest gift in Waterloo Engineering's history), the E5 groundbreaking and public launch of the Vision 2010 Campaign, gifts totaling $5 million from the Conrad family to CBET, and a one-day symposium on innovation and commercialization initiated by the Dean's Advisory Council.

The engineering communications team has also produced excellent work over the plan period, aimed at supporting the plan's goals and enhancing Waterloo's visibility as a leading multi-faceted engineering school. Communications team members have worked with the development office to support the Vision 2010 Campaign, with the graduate studies office to enhance and support graduate recruitment initiatives, with departments to ensure undergraduate recruitment strategies best meet the research-determined needs of the prospective student audience, and with student leaders to enhance support of student initiatives and communications with the undergraduate population.

Engineering print publications such as the Annual Report, WEAL and recruitment brochures remain of the highest calibre while at the same time the team is attending increasingly to new and emerging media. Electronic newsletters are now regularly distributed to engineering faculty and staff and to our alumni. This increased focus on electronic communications is reflected in the creation of a new web and e-communications officer position for engineering. This role has established a social media presence for Waterloo Engineering and is currently contributing significantly to institutional web site renewal efforts through the university's web redesign team.

Another communications focus area in recent years, aimed directly at enhancing the faculty's reputation, has been the identification and dissemination of Waterloo Engineering news items. We have significantly increased our involvement in institutional media relations efforts and have developed additional means to disseminate news stories to our various audiences.

As noted in the outreach section, the engineering undergraduate marketing and recruitment co-coordinator has worked collaboratively with that team to attract more women to engineering and to raise awareness of engineering as an area of study among younger audiences. In 2009, the co-ordinator also created a recruitment brochure for the engineering programs at the UW-UAE campus in Dubai and strategically increased confirmation initiatives for fall 2010 admissions, as outlined in the undergraduate section.

G. Computing

The Vision 2010 plan for computing recognized that in a technology-driven discipline like engineering, and at a school with a reputation for being innovative and technology-oriented, computing facilities, support and services must be exceptional. To that end, enhancements were planned for our computing environment.

Over the plan period, progress has been made toward many Vision 2010 computing goals. Most notably, communications and working relationships among computing staff in the faculty and with colleagues across the university were improved. To ensure collaboration and co-operation among computing staff and offices, regular meetings were established with staff in engineering computing and the departmental systems administrators. The Engineering Systems Admin Group includes technical staff from each department and engineering computing. A second group, the Engineering Computing

Committee, includes seven faculty members representing their departments. Over the early years of the plan, the associate dean for computing worked with the university's human resources office to institute career paths for computing staff to ensure a fair and transparent compensation structure.

The Vision 2010 goal to encourage all faculty units to move to the Nexus environment has not been met. Across campus, Nexus workstations have increased from 3,400 in 2006 to approximately 4,000 in 2009. However, the percentage of workstations in engineering that are provided by Nexus has decreased over the plan period, from 45 to 38 per cent.

Engineering computing continues to monitor and attend to changes in computing use and needs, including laptops and wireless devices. Wireless networking coverage is available in virtually 100 per cent of engineering space. Wireless usage has increased by almost 140 per cent from 2005/06, with 5,477 unique users per term in 2009/10.

The Vision 2010 plan called on engineering computing to provide leadership on the use of computing to address faculty needs and priorities. Such leadership is exemplified in the Online Faculty Information System (OFIS), which provides an automated solution for the production of generic CVs and specialized CVs required for annual merit reports, OCGS and CEAB reviews. Recently, data feeds from the university's graduate studies and research offices have been improved, and a single bibliographic entry has been created, simplifying the entry of publications into the system. To date, 45 per cent of engineering faculty have entered data in OFIS.

Looking ahead, work is underway to fold the ADS Active Directory into Nexus, which will reduce the staff time needed to support the network and will improve user support. Agreements are also currently being discussed that will improve networking services at all levels through consistency in campus network administration.

H. Space

The Vision 2010 academic plan recognized a pressing need for space. Not only was additional space essential to support the growth in faculty, staff and graduate students anticipated in the plan, it was also required to address pre-existing space deficits. To examine the changing space requirements of all departments within the faculty, a comprehensive companion space plan was initiated in June 2006 to determine current and projected space needs through to 2010.

It is important to note that the School of Architecture and the Conrad Centre for Business, Entrepreneurship and Technology, which were not part of the faculty when the Vision 2010 plan commenced and whose primary buildings are not located on Waterloo's south campus, were not included in the space plan. Neither was the Waterloo campus activity associated with our participation in the UW- UAE program, which also began after the space plan was completed. Furthermore, faculty and student increases associated with the nanotechnology program were also excluded from space needs assessments, as the nanotechnology program's space needs were met through plans for the Mike and Ophelia Lazaridis Quantum Nano Centre (QNC), which was already in progress at the university level.

It was determined that the space occupied by Waterloo Engineering in 2006 amounted to 38,680 net assignable square metres (nasm); this includes the total assigned space used by each of the six engineering departments as well as the dean's offices and faculty-wide technical, educational and administrative services. The Vision 2010 space study used University of Waterloo criteria and guidelines provided by the Council of Ontario Universities (COU) to estimate the growth in space needed to meet the projected growth in faculty, undergraduate and graduate students. This ultimately resulted in a target of 60,000 nasm. This represented an increase of approximately 55 per cent or

21,320 nasm over our 2006 space holdings. The recommended approach in order to phase progress toward this goal in reasonable increments was to plan for three buildings (E5, E6, and E7), each averaging around 7,500 nasm.

Two further issues were identified as priorities to be addressed with the addition of new space: the building fabric and infrastructure housing the chemical engineering laboratory facilities required urgent attention, and most departmental administrative operations had become quite dispersed. The plan therefore had to include some strong measure of departmental consolidation with provision for space to enhance the student experience.

Following this space inventory and needs assessment, attention shifted to seek a suitable site for E5 and to plan for E6 and E7. With space within the Ring Road seriously limited, a site was selected for the six-storey E5 building on the east campus. Critical to this decision, which had the support of university administration and the Waterloo Engineering community, was the fact that this location would also reserve an adjacent building footprint for the subsequent construction of E7. The pairing of E5 and E7 is significant in the space planning exercise: the departments of mechanical and mechatronics engineering, electrical and computing engineering and systems design engineering have been assigned floors within E5 with the proviso that they will expand horizontally into E7 downstream as the appropriate funding sources are realized.

The total space increase provided by E5 (pictured, right) is nominally 8,000 nasm. The facility will be formally opened on October 19, 2010 essentially on schedule and on budget. Exciting features of E5 include a world-class student design centre with a range of workshops, facilities, work bays, meeting rooms and computer labs to support our renowned student design initiatives, an internationally significant electromagnetic radiation facility supported by CFI funding, and a visually stunning overhead walkway that links E5 with the remainder of the engineering campus on the other side of Ring Road. With the planned expansion of three engineering departments into E5, selected space will be vacated in all existing engineering buildings. This space will be upgraded and directed specifically in support of the departments of civil and environmental engineering and management sciences for the consolidation and growth of these departments.

As noted previously, the 2006 space plan also recognized the chemical engineering department's needs, specifically the deteriorating building fabric and air quality in the Douglas Wright Engineering (DWE) building C Wing, which houses a sizeable number of research laboratories. While this department has the unique advantage of being totally consolidated within DWE, it is essentially land-locked with no obvious direction in which to expand. The preferred and only realistic solution was to consider the eventual and entire relocation of the department out of DWE. Planning progressed in this direction and the focus for E6 became the creation of a new home for chemical engineering.

Our early planning for E6 (pictured, right) proved fortuitous when, in April 2009, Waterloo Engineering was among successful on-campus applicants to the federal and provincial governments' Knowledge Infrastructure Program, securing significant funding for E6. By June 2009, the groundbreaking was held and the first phase of E6 was moving into reality. This initial phase will provide for an additional 5,550 nasm of space and will accelerate the relocation of chemical engineering to a new home on the east campus. Substantial completion is expected as early as March 2011. In the years immediately ahead it is anticipated that the second phase of E6 will be undertaken so that the entire department will once again be consolidated in one location.

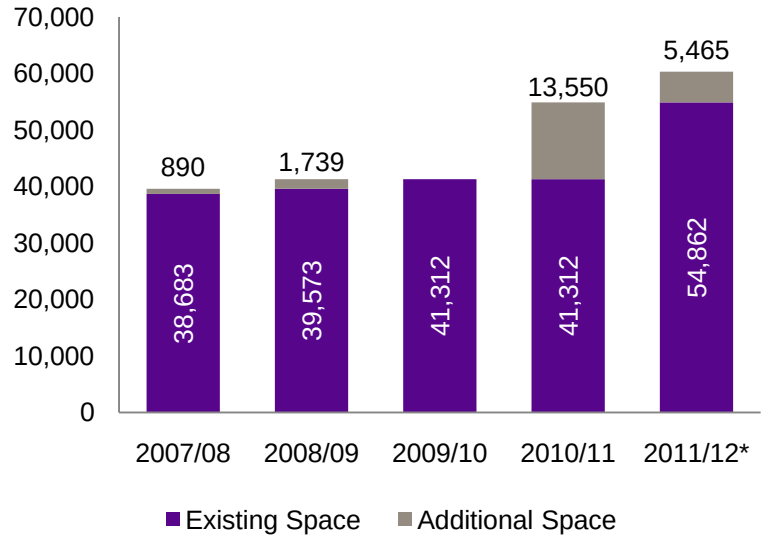
An additional consequence of being able to advance the relocation of part of chemical engineering to E6 is that the existing DWE C Wing, which includes approximately 2000 nasm, can be vacated, upgraded and refurbished to accommodate the needs of civil and environmental engineering.

With the construction of both E5 and the first phase of E6 now well advanced, an additional 13,550 nasm will be added to the faculty's space inventory. In addition, over the past three years two significant additions, totaling 434 nasm, have been completed in Carl Pollock Hall to provide important new space for management sciences, which is expanding significantly due to the introduction of an undergraduate program in 2007. Finally, two floors were added to the existing 890-nasm Energy Research Centre to provide a further 1,305 nasm in support of green energy research initiatives in the departments of mechanical and mechatronics and electrical and computer engineering. At the completion of E6, we will have 54,862 nasm of space, which represents 91 per cent of the ultimate 60,000 target defined at the outset of the space plan. Again, it is important to note that this target did not include the School of Architecture, the Conrad Centre for Business, Entrepreneurship and Technology, the nanotechnology program or the UW-UAE program's Waterloo activities.

Outside of the faculty space plan, an estimated 5,465 nasm of additional space in support of the faculty's nanotechnology program will be available in the Mike and Ophelia Lazaridis Quantum-Nano Centre (QNC, pictured at left), now under construction and projected for completion in late summer 2011.

Including this space in the QNC building, from 2006 to 2011 Waterloo Engineering's total space holdings will increase by 56 per cent and the nasm per FTE student will increase by 27 per cent, to 10.6 in 2011.

Figure 33: Waterloo Engineering Space Holdings (nasm) to 2011/12

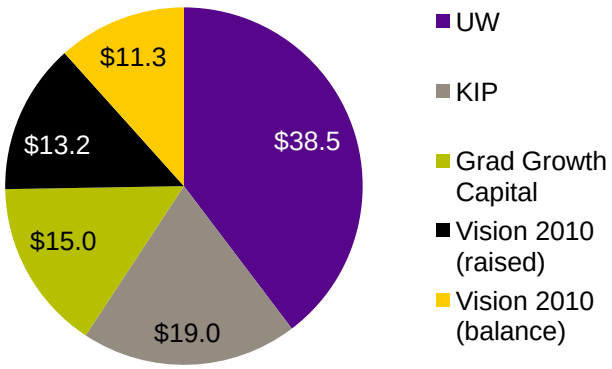


* Additional space of 5,465 nasm in 2011/12 consists of the QNC building, which accommodates nanotechnology program growth not included in the Vision 2010 space needs analysis.

As mentioned previously, these space holdings figures and ratios exclude both the School of Architecture and the Conrad Centre for Business, Entrepreneurship and Technology, whose space holdings are located outside of the university's south campus. When the School of Architecture's building in Cambridge and the Conrad Centre's home in the Accelerator Building on Waterloo's north campus are included, the faculty's space holdings will total approximately 65,970 nasm.

Clearly, excellent progress has been achieved in developing the space required to effectively support Waterloo Engineering's programs, but considerably more needs to be accomplished. The top space priorities going forward include securing the remaining private funding for the construction of E5 and E6 and the renovation of DWE, and the commencement of the construction of E7.

Figure 34: Financing E5 and E6



I. Finances

To support the implementation of the Vision 2010 plan, a pool of resources was established in the form of an academic priorities fund (APF). The APF, matched by an allocation from the Provost, was used to create most of the new faculty and staff positions in the Vision 2010 plan. These positions were selectively allocated to the departments and support units on the basis of the quality of each unit's plan and the degree to which each would help the faculty reach its aspirations. We believe this process worked very well and helped us realize many of the Vision 2010 goals.

As mentioned earlier in this report, the pace of faculty hiring was slowed for a number of reasons. The most important of these was the need to put aside some funds on an annual basis to help support our building program. These funds were matched with the Provost and this arrangement has resulted in about $38.5 million currently in the building fund. Again, we believe that this arrangement has been a great success. Without it we would not have been able to pursue the ambitious expansion initiative that was so badly needed to address our space requirements.

Of course, all is not well on the financial front. Nearly every year, the faculty together with the rest of the university had to reduce its budget by an amount ranging from 1 to 3 per cent. The cumulative effect of these reductions (about 12 per cent) has been very constraining.

To cope with the budget reductions and at the same time pursue our ambitious Vision 2010 plan, our policy has been to participate in all of the university's revenue-sharing initiatives and to work hard to diversify our revenue sources. As a result, our budget has in fact grown, reaching approximately $72 million in 2009/10, a spectacular 53 per cent increase over the plan period (before adjusting for inflation). A careful analysis of the budget would indicate that nearly one-third is a result of revenue-sharing programs such as differential tuition fees, undergraduate expansion, international undergraduate enrolment and graduate growth (both domestic and international).

Here it is also worth noting that the expansion of graduate domestic enrolment has thus far generated $15 million in capital funds that are applied toward our building program. Of course, to achieve the remarkable graduate growth reported earlier in this document, we had to invest considerable resources.

Two major revenue-source diversification strategies are our fundraising campaign, discussed in Section II.F and our efforts to increase external funding for our research, described in Section II.D. In 2007 we publicly launched our Vision 2010 Campaign with a goal of $120 million, approximately half of which was for buildings and the other half for research chairs and student fellowships. Unfortunately, shortly after our launch the global economic downturn occurred. Nevertheless, we have managed this far to raise $75 million. As well, the faculty's endowment has grown to $70.5 million. Although Campaign Waterloo is wrapping up with the departure of President Johnston at the end of September 2010, the Vision 2010 Campaign will transition into its second phase with the new Dean's Development Council under the leadership of Dr. Savvas Chamberlain. Our aim is to reach our $120-million goal by June 30, 2012.

In conclusion, despite the constraints of annual budget reductions and the negative impact of a global economic crisis, Waterloo Engineering has still managed to thrive. We attribute this to good planning that enabled us to take full advantage of every possible opportunity.

J. Organizational Matters

The Faculty of Engineering is governed by the Engineering Faculty Council (EFC) and its standing committees. The operating and academic units of the Faculty each have their own leadership and organizational structures, many of which have evolved over the plan period, as has the Faculty organizational structure itself. Appendix J includes a current Waterloo Engineering organizational chart.

In 2007, Waterloo Engineering welcomed the Centre for Business, Entrepreneurship and Technology and its executive director to the faculty. Two additional associate dean portfolios were also introduced during the plan period, one for co-operative education and professional affairs and the second for outreach. As a direct result of plan goals, staff representation was established on EFC and the Dean's Staff Advisory Committee (DSAC) and the Dean's Advisory Council (DAC) were created.

Over the past decade Waterloo Engineering introduced a number of innovative undergraduate programs that cross departmental boundaries and sometimes also faculty boundaries. These programs, not shown on the faculty organization chart appended, have a very lean administrative structure. Appendix K provides a listing of these programs and their directors. Also not shown on the faculty organization chart are research centres and institutes. A listing of the major centres and institutes, together with their directors, is provided in Appendix L.

As various administrative terms have ended within the faculty's leadership, a number of new leaders have joined and participated in the plan's implementation. In all, over 30 academic leaders and senior staff have participated on the Engineering Planning Committee, developing and implementing the Vision 2010 plan. Without the commitment, energy, vision and expertise of these individuals, this plan would not have enjoyed such success, and Waterloo Engineering would not be in the excellent position it is today.

In each year of the plan process, our update document has included an overview of changes in leadership positions. Over the course of the past year, the following individuals have left and joined the Engineering Planning Committee:

Peter Douglas, associate dean computing and associate dean graduate studies, began a one-year term as director of the UW-UAE campus in September 2009. As director, he is responsible for overseeing all aspects of Waterloo's new campus in Dubai, United Arab Emirates, including the civil and chemical engineering programs offered there.

During Peter's term in the UAE, Richard Culham agreed to act as associate dean, graduate studies in addition to his portfolio as associate dean, research. Beth Jewkes, chair of management sciences, accepted the position of acting associate dean of computing.

Recently, Peter Douglas has been renewed as director of the UW-UAE campus. As a result, a new associate dean has been named for graduate studies: Ray Legge, a chemical engineering professor, began a three-year term on July 1, 2010.

Frank Safayeni is acting as chair of management sciences while the search is completed for a successor to Beth Jewkes. Beth stepped down on July 1, following nine years of leadership and commitment to the department which included the development and introduction of a new undergraduate program. She continues to provide leadership and service to the Faculty as acting associate dean of computing until the end of October.

III DEPARTMENT REPORTS

This section includes the executive summary of the final Vision 2010 report that each academic unit in the Faculty of Engineering submitted in spring 2010. To view a department's full report, please contact the department head directly.

A. School of Architecture

Rick Haldenby, Director

A report was not available from the School of Architecture at the time of printing this report.

B. Conrad Centre for Business, Entrepreneurship and Technology

Howard Armitage, Executive Director

On March 25, 2002, University of Waterloo Senate approved the creation of the Centre for Business, Entrepreneurship and Technology (CBET). Envisioned as a cross-campus initiative to leverage and grow Waterloo's reputation for technical entrepreneurship, CBET's mandate was to develop an infrastructure that supports the growth of entrepreneurship-related education, research and student development activities.

The Conrad Centre for Business, Entrepreneurship and Technology has many successes to report, and a clear plan for continued growth and development over the next five years. Its flagship academic program, the Master of Business, Entrepreneurship and Technology (MBET), has quickly earned a reputation as a distinctly different and needed addition to the Canadian graduate business education landscape. One hundred and ninety-eight students have graduated from the program during the first six years. The 2009/10 class has 61 (52 full- and nine part-time) students, up from 22 in the first year of the program. Over half of the graduating students develop their own businesses. Others quickly find positions in companies and technology-transfer organizations that appreciate their intrapreneurial nature and knowledge of the commercialization process.

Faculty associated with the centre carry out interdisciplinary research focused on the key themes of entrepreneurship and innovation. The centre also helps co-ordinate the large number of entrepreneurial student organizations on campus, and is the umbrella academic unit that will co-ordinate and operate important initiatives such as enterprise co-op and undergraduate options in entrepreneurship. The centre also serves the local business community through student practicums and education programs for the owners and managers of small and medium-sized enterprises. The centre is also operating both academic and outreach programs in the United Arab Emirates.

Thanks to a major $2 million donation by Manfred and Adrian Conrad in March 2007, CBET was able to move into new space in the Accelerator Centre. This April, the Conrad family donated an additional $3 million, a gift which allowed the university to rename CBET to the Conrad Centre for Business, Entrepreneurship and Technology. With this recent gift, the centre's capital campaign goal of $7 million was achieved. Additional fundraising is still underway, and badly needed to support scholarships and room naming opportunities.

The centre has recently held a number of strategic planning meetings that included faculty, staff, alumni and advisory council members. Our priorities arising from these discussions include executing well on the priorities we have already set for the MBET and diploma programs and successfully launching a few critical new initiatives. These include expanding our MBET program to include concentrations in digital media and social innovation, spearheading the Waterloo component of the executive master program in business and technology and resurrecting a sustainable E-Co-op program at the undergraduate level.

The Conrad Centre for Business, Entrepreneurship and Technology has a bright future. It is viewed by many as one of the outstanding models of entrepreneurship education and practice in North America. However, it is still a young entity that needs additional nurturing and university support. We are making

progress on some of our previous impediments to growth. Challenges that need to be met in the coming few months include delivering program excellence and meeting our faculty requirements.

C. Chemical Engineering Department

Tom Duever, Chair

The faculty and staff of the Department of Chemical Engineering have worked hard over the last five years towards implementing the goals set out in the Vision 2010 plan.

A great deal of time, effort and money has been expended to improve the space situation in the department. First and foremost, the chemical engineering space committee, with the help of Sue Gooding and Ron Ventor of the dean's office, met regularly since September 2008 to work on designing E6, the new home for chemical engineering. Construction of the first half of E6, the new chemical engineering research building (ChE1), is well under way with completion scheduled for spring 2011. Additionally, over the course of the plan period, seven new research labs have been created primarily for new faculty members. A new, larger chemical engineering home classroom was also built, creating a better learning environment for our undergraduate students. Our workshop was relocated to the former chemical engineering stores to allow for some of the lab renovations and to make optimum use of our existing space. The chemical engineering main office has been completely renovated, with the addition of 10 new offices to accommodate new hires in chemical engineering and to provide for a consolidated suite of offices for the nanotechnology undergraduate administration and support team until the new nanotechnology facility opens in 2011. The total cost for these renovations is approximately $1 million, with the department contributing one quarter of this total. The location of quality research space for new faculty hires continues to be a major preoccupation as we continue to implement the growth outlined in our plan. To this end, five faculty have been provided with research lab space in C2 and ESC; however, renovations to these labs have been extremely slow and are not yet complete. Finally, the department has contributed $850,000 to the Faculty of Engineering building fund, which is matched 3:1 by the centre and the faculty for a total of $3.4 million.

The department has made great strides in hiring faculty and staff over the last year. The highest priority was toward hiring all required personnel to support the undergraduate nanotechnology program. Over the plan period, eight new faculty have been hired: six assistant professors and two associate professors. Of the eight appointments, two are definite-term appointments. By August 2010 it is expected that two more appointments will have been made, one at the assistant level and one continuing lecturer, bringing the total number of hires to 10 during Vision 2010. Over the plan period, the department has hired four new staff members including a staff instructor, two lab instructors (one in chemical engineering and one in nanotechnology) and one business development officer for the nanotechnology program.

The nominal teaching load has been reduced to three tasks per year, effective January 2008. This has been achieved through an increase in the faculty complement, the hiring of a staff instructor and by using a larger than desirable number of sessional appointments. Initially it was thought that the number of sessionals would decrease to acceptable levels by 2009/10; however, as we engaged in the UAE program the number of sessional appointments needed has increased again, indicating the need to start recruitment of faculty for this effort very soon.

The number of graduate students has grown over the plan period peaking at 157.8 FTE in fall 2008. The increase can be explained by the increase in faculty complement and by increasing the ratio of research graduate students/faculty. This ratio stands at roughly 4.4 and the department will work towards reaching the target which has been set at 5.0. In addition in 2007/08 and 2008/09 the department was particularly successful in attracting Canadian and permanent resident applicants into

the graduate program (30 per cent increase in CPR enrolment in 2007/08 over 2006/07) partly due to the incentives that were offered to faculty to take on CPR graduate students. In 2008/09 we still saw a significant increase in CPR enrolment (22 per cent), but at the same time the increase in international students has also been strong (21 per cent). In 2009/10 the number of graduate students fell slightly; however, the international student numbers continue to exceed our predictions. Graduate student recruitment will continue to be a high priority for the department over the next years.

The number of graduate courses offered per year stands constant at 17. These include five 500 level courses, four 600 level courses that are held with 500 level courses and eight 600 and 700 level courses. In addition the department has instituted core graduate course lists from which students must select two of the courses they are required to take. Students must receive a minimum grade of 70 per cent in the core courses. As the faculty complement grows the number of graduate courses offered will continue to increase.

The "Park Reilly Distinguished Seminar Series in Chemical Engineering," now in its second year, has proven very successful with a strong roster of high calibre speakers and strong attendance by our graduate students. The department has also introduced a seminar attendance milestone to all graduate programs.

The department's research performance as measured by Web of Science publication rates continues to be very strong. Five-year publication totals put us in the top three in Canada and among the top 20 in North America. In addition research funding has been very strong in 2008/09, with total funding of $5.4 million. In 2009 chemical engineering faculty members published 153 refereed journal papers or 4.5 journal publications/faculty.

A new undergraduate curriculum has been approved and implemented over the plan period to give students a better laboratory experience, introduce new courses and give students more flexibility by introducing more technical electives. In addition new undergraduate laboratories have been introduced.

The UAE program is well underway with Professor Douglas having been appointed the director. Professors Chatzis and Pal each spent a semester teaching the first crop of chemical engineering students in Dubai.

D. Civil and Environmental Engineering Department

Neil Thomson, Chair

Since 2005, the Department of Civil and Environmental Engineering (CEE) has gone through some major administrative transitions with the replacement of the department chair and both existing associate chairs. In addition, to support the civil engineering program offered at the UW-UAE campus, we added a new associate chair responsible for the UAE civil engineering program.

Over the last five years the CEE faculty complement has grown from 31 to 34.25 FTE. During this period there has been one retirement, one resignation, and the appointment of five assistant professors and one professor (0.25 FTE). This is approximately equal to the faculty complement in the early 1990s before the special early retirement program (SERP) was announced. The FTE staff complement and the overall faculty to staff ratio have remained relativity stable since 2005 at approximately 15 and 2.

The total enrolment in our three undergraduate programs has increased and the quality of our applicants has steadily improved since 2005. We continue to meet or exceed admission targets as a result of a higher percentage of accepted offers. This trend is clearly reflective of the strength and demand of these three programs. In 2009, the percentage of women in each of our undergraduate

programs was 22.6 per cent, 50.3 per cent and 24.7 per cent for the civil, environmental and geological engineering programs respectively. There has been a notable increase in international students in CEE programs. The 2009 undergraduate student to faculty ratio of 16.6 is slightly below the 2005 value of 16.9, and is equal to the faculty average. CEE undergraduate students consistently perform well in national and international competitions.

The teaching load in the department has remained at three courses per year for four years in a row. This reduced teaching load has allowed the CEE faculty to focus more of their energy and time on research activities.

Since 2005, there has been a steady growth in all of our graduate programs. The PhD and MASc graduate research programs have grown by 46 per cent and 70 per cent respectively. The CEE professional master's program (MEng) has grown by 76 per cent. The FTE research graduate student to faculty ratio increased to 4.9 in 2009 from 3.7 in 2005. This increase clearly indicates our success to grow the CEE graduate program and our commitment to increase research productivity.

The gross CEE sponsored research funding has grown by 23 per cent since 2005. The average research funding per faculty member in 2009 was $211,000 compared to $173,000 in 2005.

A considerable amount of work and planning has been directed towards offering our outstanding civil engineering program at the UW-UAE campus that started in September 2009. We are all looking forward to this exciting opportunity to expand our international reputation.

The faculty and staff of the Department of Civil and Environmental Engineering have worked hard to implement the VISION 2010 goals over the last five years.

E. Electrical and Computer Engineering Department

MANOJ SACHDEV, CHAIR

The Electrical and Computer Engineering (ECE) Department has made significant progress in the last five years. In many aspects, we have exceeded our Vision 2010 targets in spite of the global financial difficulties of the last two years. The department grew at a rapid pace during the plan period; therefore, we felt a need for departmental restructuring to better serve our stakeholders. The department established a task force for restructuring in 2008. The task force made several key recommendations, including a clear chain of command, empowerment and responsibilities of each office bearer, etc. The creation of the senior associate chair position has allowed the department to address administrative and technical staff issues in a timely fashion. The department's new organizational structure, effective from 2009, has significantly improved the operational complexities involved in managing one of the largest engineering departments in the country. The department is presently working through staff-level reorganizations as part of a multi-year journey towards a smoother and more efficient operation.

At the undergraduate level, the department participates in five programs. The electrical engineering and computer engineering programs are solely run by the department while software engineering, mechatronics engineering and nanotechnology engineering programs are run in collaboration with other departments/faculties. At the undergraduate level, as planned, the department witnessed a modest growth during the plan period. In 2009, we enrolled 345 students in electrical and computer programs against our plan target of 330. Similarly, in collaborative undergraduate programs we have either met or exceeded our target of 100 each. The department continues to attract top ranking students from Ontario and beyond.

Significant progress was made in our efforts to keep the ECE undergraduate curriculum up-to-date and relevant in the 21st century. In 2007, we extensively reviewed the ECE curriculum's core courses. In 2008, we started working on revamping our fourth-year technical electives. The motivation was to ensure our graduates complete their degrees with a contemporary knowledge base and state-of-the-art engineering skills. The ECE students that started in September 2009 are now taking the "new" curriculum. Along with the curriculum renewal, the department also made a multi-year, $2 million commitment to upgrade undergraduate laboratory equipment. Both of these activities are likely to improve the undergraduate student learning experience and student skills. The department is also attracting larger numbers of international undergraduate students, suggesting an enhanced international profile. In 2009, we had 105 international ECE students out of a total of 1,472. However, attracting high quality female candidates for both electrical and computer engineering is a known problem and a cause of concern. Similarly, despite aggressive hiring practices, the ratio of ECE undergraduate students to faculty is the highest (19.7) in the Faculty of Engineering.

At the graduate level, we exceeded our target by a wide margin. In 2009, the department had 583 graduate students against the plan target of 441. The department had 265 PhD, 146 research master's (MASc), and 172 professional master's (MEng) students. A substantial growth in MEng students suggests that the department is serving an unmet societal need for re-training in a rapidly changing work environment. There is a significant opportunity for further growth in the MEng program; however, we believe it will be at the cost of the graduate research enterprise. Therefore, we consciously decided to maintain a target ratio of 2:1:1 for PhD:MASc:MEng students in the department. The growth in the graduate program is particularly noteworthy in spite of our inability to aggressively hire faculty and staff members in the last two years. The ECE FTE graduate student to faculty ratio has grown to 7.2 – the highest in the faculty. The department has a strong, diversified research profile and we continue to attract some of the brightest national and international students for graduate studies. The department also co-launched two new collaborative graduate programs, in nanotechnology and in quantum information, which were approved by the Ontario Council of Graduate Studies in 2009 and early 2010 respectively.

The ECE department continues to excel in research. In 2008/09, the department attracted overall research funding of $19.5 million compared to overall research funding of $9.8 million in 2004/05. Two more professors became IEEE Fellows during the 2008/09 period, adding to the long list of ECE professors who are IEEE Fellows. In calendar year 2009, the ECE department hosted 55 invited research seminars, given by prominent invited speakers from across the world. The department boasts more than 25 per cent of its faculty members as research chair holders. The one-millionth copy of a textbook authored by Dr. Adel Sedra, ECE professor and Dean of Engineering, was ceremoniously presented at spring 2008 convocation. A significant effort was devoted to the hiring of top notch candidates from across the globe. The department hired 21 faculty members, three administrative staff and four lab instructors during the plan period. During the same period, two faculty members, Prof. Aplevich and Prof. Wilson, retired after long and meritorious service, five faculty members left the department to pursue other interests, and one faculty member died. An administrative staff member left the department, lab director Bill Ott retired after more than two decades of meritorious service, and two lab instructors moved on to other interests.

The construction of the three-storey Energy Research Centre building was completed in 2008. The ground floor of the building houses the department's Centre for Advanced Photovoltaic Devices and Systems, a unique research facility dedicated to photovoltaic materials, devices and systems. It became functional and the researchers moved in to the new location in 2009. However, lack of space is becoming a constraint on our ability to sustain further growth in research and graduate expansion. We expect that the completion of Engineering 5 in 2010 and the Mike and Ophelia Lazaridis Quantum-Nano Centre in 2011 will alleviate some of these issues.

F. Management Sciences Department

BETH JEWKES, CHAIR

As part of the Faculty of Engineering Vision 2010 planning process, the Department of Management Sciences completed a comprehensive self study in 2005 and, with the assistance of a subsequent external review, developed a strategic plan which was published in May 2006. In the plan, we set out the department's goals and aspirations in six broad categories: faculty and staff, undergraduate studies, graduate studies, research, resources, and development and alumni relations.

Since publication of the initial plan in 2006, the department has produced a series of annual reports in which we reviewed progress towards our initial goals and in which we also had the opportunity to re-evaluate our original plans. This document is management sciences' fourth and final Vision 2010 update. In it, we assess our overall progress, and then, from our new vantage point, consider what challenges and opportunities present themselves as we move forward.

The department successfully attracted two new operations research faculty members in 2009 and has three additional hires confirmed for 2010/2011: two in information systems and one in operations research. We have also had three resignations, one in behavioural sciences, one in operations research and one in management of technology. We continue to recruit; however, we are behind by several positions.

Since the beginning of the plan period, the department has grown in size from 16 to 20.25 FTE faculty. In the next few years, high on our priority list is to continue to recruit high quality faculty members so that we reach our steady state size of 31 FTE within three years. For existing faculty, we will continue to emphasize the importance of registering as a professional engineer.

In 2009, a chair's secretary was hired, and there was a subsequent re-alignment of administrative staff duties between the chair's secretary and the administrative assistant. We have continued to defer hiring a technical staff member, a co-op employment and industry liaison staff, and a 0.5 FTE resource manager due to hiring slowdowns. There is some concern that not having the co-op employment and industry liaison role filled is hampering development of co-op jobs and slowing dissemination of our program's existence to industry. Overall, we have hired 1.5 new FTE staff members since the start of the plan period. When the finances associated with our online master's degree were made part of our operating budget in 2008, an additional 1.6 FTE staff members were moved into our staff counts.

Management engineering intake in the fall of 2009 was 72 students, 12 above our target of 60. At 10 per cent, it has the highest percentage of international students of all undergraduate programs in the faculty. We have just over 30 per cent women in our program, also amongst the highest in the faculty. Changes in our 1B curriculum that took effect in 2010 have resulted in a lower failure rate this year, but we continue to struggle with finding sufficient co-op jobs for post 1B students. Among our priorities moving ahead will be to find sufficient first-year co-op opportunities, and to increase the quality and size of the management engineering application pool.

Course enrolments in the management sciences option increased from approximately 2,300 to 2,900 student-courses over the plan period. Management sciences is unique in the Faculty of Engineering in that we are the only department that teaches a significant number of students enrolled in other departments. Last year, we devised a method to compute an equivalent FTE load for management sciences which was based on the total student-credits taught by the Faculty of Engineering. Based on this metric, our equivalent FTEs in 2008(2009) were 391(384), and our equivalent student:faculty ratios are 20.33(18.15).

In 2009, our FTE graduate enrolments reached 146.2 FTE students, up 48 per cent from our baseline enrolment of 98.8 FTEs. As of fall 2009, 31 per cent are women, 22 per cent are international, and approximately 39 per cent are in research degrees (split evenly between master and PhD). Over the plan period, we have seen an increase in the percentage women (from 26 per cent to 31 per cent) international students (from 15 per cent to 22 per cent) and professional master's degree students (from 55 per cent to 61 per cent).

The department's sponsored research funding per faculty member has climbed from approximately $18,000 to $41,000 over the plan period. Our new faculty members have been successful with their Tri-Council applications. In the future, securing additional industry funding will be a key component of increasing our overall research support.

In terms of space, management sciences will have fully committed its office space by July 2010. It is critical that we firm up a plan whereby the department can secure additional space resources within the next six months as our undergraduate program approaches its CEAB pre-accreditation visit in December 2010. With E5 space coming on stream, it appears that most of our space needs can be planned (but not occupied) within the next few months.

We continue to utilize bulletin boards to promote news items about our students and faculty and to ensure that these items are given to the faculty communications staff for dissemination. A new poster for management engineering as well as a new video about the program were produced in 2009. A priority for 2010 will be to update our departmental web pages to ensure they are informative, easily navigated, and attractive to prospective students and external parties.

This is an exciting time for management sciences as we look to our future. We are encouraged as our undergraduate program unfolds, as we bring new faculty members into the department and as we have been able to more fully establish our research foci. Moving forward, our primary goals will be to see a successful accreditation for management engineering, to complete our hiring plans, and to move into newly acquired space needed to support our new activities.

G. Mechanical and Mechatronics Engineering Department

PEARL SULLIVAN, CHAIR

Over the last four years, the Department of Mechanical and Mechatronics Engineering (MME) worked diligently to implement its ambitious strategic plan, which was developed through wide departmental consultation and participation. Under the leadership of former chair Prof. G. Schneider, the plan aspired to position our department as a centre of excellence for teaching and research so we can reach our longer-term goal which is to be recognized as the top ranked mechanical engineering department in the country. The highest priorities included establishing a physical headquarters for departmental identity, intensifying industry-partnered research activities, expanding graduate programs and promoting teaching leadership. We seized the opportunity presented by the Vision 2010 planning exercise to enhance resources in key support areas namely, faculty and staff complement and physical space. As we approach the end of our implementation efforts, the latest available data show that we have met nearly all our targets and even exceeded some. More importantly, the impact of Vision 2010 on the department has already been profound: re-energized academic and support staff; a revitalized graduate program; enhanced research profile and reputation within government and industry circles; stronger engagement with undergraduate students; and university and provincial recognition for leadership in teaching.

There were five main goals in our strategic plan. The first was to increase physical space and create a central departmental identity. In fall 2008, we occupied 1,200 m^2 of office and laboratory space on the

second and third floors of the new Energy Research Centre (ERC). The building allowed us to consolidate new state-of-the-art laboratories for fuel cell, solar, hydrogen materials and air pollution modeling research under one roof. We relinquished 240 m^2 of office space in CPH immediately after that move. We have recently moved out of 21 offices in the E2 building and into the third floor of the new E5 Building (1,500 m^2). The move, completed this summer, is a pivotal milestone as MME now has, for the first time in the department's history, an identifiable administrative headquarters. After relinquishing another 600 m^2 in E2, our total net increase in physical space including ERC will be about 1,800 m^2.

Our second and third goals were closely linked. The second was to enhance external relations and the third was to intensify and enhance our research productivity. We re-designed our website to promote our research themes and capabilities, appointed an associate chair for research and hired a director of industry and government relations. The associate chair position, however, was dissolved in 2008 due to lack of operating resources. While it is difficult to gauge the impact of these actions and support positions, the quality and health of our department's research are unequivocal.

The most direct measure of our progress on the research front is external funding: $5.9 million in 2004/05; $6.7 million in 2005/06; $9.4 million in 2006/07; $8.4 million in 2007/08; and $9.1 million in 2008/09. Some of the increase was an immediate effect of increasing our faculty complement in strategic research areas. We have filled 10 new plan positions since 2006 with eight of them in targeted strategic areas: one in automotive, three in mechatronics, two in green energy, one in biotechnology and one in nanotechnology. Although not in the original plan, we also succeeded in recruiting an eminent expert (D. Li) in microfluidics to a Tier I Canada Research Chair in nanotechnology.

The future of research in the department is very promising. In the last seven years, we rapidly expanded the size of our faculty complement. We now have 51 faculty members. Our rigorous hiring practices have built up a pool of very talented and motivated academics – we have the highest proportion of assistant professors in the Faculty of Engineering (32 per cent) but are tied for second place on the basis of average research dollars per faculty member. Overall, about 95 per cent of our tenured/tenure track faculty members hold an NSERC discovery grant and almost all of them collaborate with industry partners.

An indicator of the relevance of our applied research activities is the increase in contract funding. In 2006/07, 30 per cent of our research income was from contracts but the proportion is now approaching 50 per cent. Our largest source of industry research income continues to be the automotive sector. We were able to remain strongly engaged in the core areas of manufacturing and materials, and secure new partnerships in vehicle mechatronic systems, in spite of the economic downturn in 2008/09. New faculty members perform well in national and international competitive grants and are actively building research areas that the department has identified for strategic focus and investment. Two emerging thematic areas which have formed critical mass are green energy and nano/microtechnologies.

MME now has five active Canada Research Chairs – three Tier I Chairs in the areas of high strain rate deformation, micro-/nano-fluidics, and mechatronic vehicle systems, and two Tier II Chairs in microjoining and lab-on-a-chip technology. Five faculty members have received the prestigious Early Researcher Awards. Our junior faculty members have won prestigious national and international awards including the Professional Engineers of Ontario Young Engineer Medal in 2006 and the SME Outstanding Young Manufacturing Engineer Award in 2007.

Our fourth goal was to provide leadership in teaching across the department. Prof. G. Stubley was appointed the first teaching chair in early 2006. He undertook the important role of mentoring new faculty and led a series of teaching forums and engineering education workshops together with the University Centre for Teaching Excellence. In 2007, he won one of only two Leadership in Faculty Teaching Awards granted to Waterloo by the province. His insightful work and dedication led to two

more awards in 2009: the University of Waterloo Distinguished Teacher Award and the Ontario Confederation of University Faculty Associations (OCUFA) Teaching Award. Dr. Stubley also developed and conducted exit surveys for both the mechanical and mechatronics engineering programs. The feedback will be instrumental for guiding the department in its goal to improve the quality of student learning through improved teaching practices and new approaches for student engagement. Our students' learning remains front and centre on our teaching excellence agenda. Three MME faculty members received the Sanford Fleming Foundation Teaching Excellence Awards in 2008, 2009 and 2010 respectively.

Our fifth goal was to expand and improve our graduate programs. We realized our target to increase our 2004/05 enrolment at 150 by 60 per cent over four years or to 240. We are now at 248. Our PhD program grew by 120 per cent to about 100 students while our MASc program increased by nearly 45 per cent to 110 students. We invested heavily in recruiting Canadian and permanent resident (CPR) students, in response to the province's Reaching Higher agenda, resulting in 90 per cent CPR enrolment in our MASc program. Another 45 FTE CPR students are enrolled in our professional coursework program (MEng). In 2007, we created three new specialization MEng graduate certificates in green energy, design, and fire safety to attract working engineers. Half of our MEng students are part-time. We also committed to annual offerings of 10 core graduate courses to regularize our graduate program for research students. The department provided leadership for the creation of an exciting new multidisciplinary collaborative graduate program in nanotechnology involving three other engineering departments and three science departments.

Another notable highlight of the past four years is the accreditation of the new mechatronics engineering program (MTE) in 2008. We have since graduated two excellent cohorts of about 90 students. Our reputation for leadership in MTE education remains strong; last year, the highest high school admission average for engineering was the MTE program. We, however, have not been as successful in recruiting female students. Our current proportion of admitted females is the lowest in the faculty at about 7 per cent. Critical to the implementation of the MTE program was support staff. As part of our plan, we hired two positions, an IT manager and an electronics technologist, to support the program.

Vision 2010 provided us with an important opportunity to take stock of our environment and articulate our collective aspirations. With the support of the faculty, we were able realize the goals in our plan despite of deep cuts to our operating budget. We end this exercise with enormous momentum – a distinctive physical identity and virtually all performance indicators at historic highs. This is not a conclusion but a beginning for new possibilities as we seek to gain recognition as the mechanical engineering department of choice in Canada. The department is now an ever more dynamic unit only because of the tireless hard work, perseverance and dedication of our faculty and staff who give their best each day. I want to express my sincere gratitude to all my colleagues and also to the Dean of Engineering for four very successful years.

H. Systems Design Engineering Department

Glenn Heppler, Chair

From 2005 through to 2010 the Department of Systems Design Engineering made good progress towards meeting the objectives and goals set out in the Vision 2010 strategic plan. The most significant event was the completion of the Engineering 5 building which has both increased and improved the space available to the department undergraduate program. Indirectly it has made more research space available to the department. This was a major goal in the Vision 2010 strategic plan and has been successfully met.

We reached the Vision 2010 strategic plan target of three teaching tasks per faculty member while, at the same time, rationalizing the number of undergraduate electives offered by the department and improving graduate course offerings. The department undergraduate and graduate curriculum committees have completed and begun to implement the effort begun in 2006 to establish a revised undergraduate program that would see a design course in every term, a reduction in the number of undergraduate elective offerings from 21 to 15, and an increase in the number of annually offered graduate (600 level) courses form 11 to 18. These curriculum efforts are necessary for the department to position itself within the new undergraduate programs in the faculty and the emerging research directions in engineering.

As of 2009, the department had increased its faculty complement by five to 24.3 faculty members. This increase in complement has greatly strengthened our activities in human factors and biomedical engineering. There are 13 faculty members who hold PEng registration and three who have applied for registration.

The department intake target of 90 students has remained unchanged during the past five years. Recruitment efforts have resulted in only small changes in the application rate but we have experienced large swings in acceptance rates of our offers for admission to 1A. The number of women students in the undergraduate program has remained stable and of the 370 students enrolled in systems design engineering last year 25.7 per cent were women.

The department was successful in increasing the number of PhD students in the department in 2009 to 105 (as compared to 88 in 2005); 21.9 per cent of those students were women.

The top priority for the coming years is to recruit more and better undergraduate and graduate students. This will require finding effective recruiting methods through the better utilization of social networking media. Action will be taken to identify and ameliorate the causes of the historically high undergraduate failure rate. One direction which should be pursued in this regard is to establish a department culture that is uncompromising in its expectations of excellence in effort and outcome of both students and faculty.

The graduate course offerings continue to be a high priority area for departmental attention. The creation of a well-defined MEng program is one initiative that requires continued effort.

Continued participation in the faculty-wide effort to secure more space is essential for the coming years. Our goal is to see the department consolidated into one building with faculty, staff, undergraduate and graduate students in close and effective proximity to one another.

IV APPENDICES

A. FACULTY AND STAFF DATA

Regular Faculty, 2009/10

May 1, 2010 count date
Excludes definite-term, research and visiting professors

(A) by department and gender

Department	Male	Female	Total	%Women
Architecture	10.0	6.0	16.0	37.5%
BET	3.0	0.0	3.0	0.0%
Chemical	29.0	2.0	31.0	6.5%
Civil & Environmental	32.3	3.0	35.3	8.5%
Electrical & Computer	69.5	8.0	77.5	10.3%
Management Sciences	15.3	5.0	20.3	24.7%
Mechanical & Mechatronics	42.0	9.0	51.0	17.6%
Systems Design[1]	21.3	4.0	25.3	15.8%
Support Unit Offices	1.0	0.0	1.0	0.0%
TOTAL	223.3	37.0	260.3	14.2%

(B) by department and rank

Department	Professor	Assoc.Prof.	Asst.Prof.	Lecturer	Total
Architecture	1.0	11.0	3.0	1.0	16.0
BET	1.0	0.0	0.0	2.0	3.0
Chemical	18.0	7.0	6.0	0.0	31.0
Civil & Environmental	18.3	6.5	8.5	2.0	35.3
Electrical & Computer	29.0	26.0	18.0	4.5	77.5
Management Sciences	7.3	6.0	6.0	1.0	20.3
Mechanical & Mechatronics	26.0	7.0	17.0	1.0	51.0
Systems Design[1]	9.0	10.3	4.0	2.0	25.3
Support Unit Offices	0.0	0.0	0.0	1.0	1.0
TOTAL	109.5	73.8	62.5	14.5	260.3

NOTE:
1. Systems Design includes 3 Centre for Society, Technology, and Values faculty members.

Tenured and Tenure-Stream Faculty, 2009/10

May 1, 2010 count date
Excludes lecturers, definite-term, research and visiting professors

(A) by department and gender

Department	Male	Female	Total	% Women
Architecture	9.0	6.0	15.0	40.0%
BET	1.0	0.0	1.0	0.0%
Chemical	29.0	2.0	31.0	6.5%
Civil & Environmental	30.3	3.0	33.3	9.0%
Electrical & Computer	65.0	8.0	73.0	11.0%
Management Sciences	14.3	5.0	19.3	26.0%
Mechanical & Mechatronics	41.0	9.0	50.0	18.0%
Systems Design	19.3	4.0	23.3	17.2%
TOTAL	208.8	37.0	245.8	15.1%

(B) by department and rank

Department	Professor	Assoc.Prof.	Asst.Prof.	Total
Architecture	1.0	11.0	3.0	15.0
BET	1.0	0.0	0.0	1.0
Chemical	18.0	7.0	6.0	31.0
Civil & Environmental	18.3	6.5	8.5	33.3
Electrical & Computer	29.0	26.0	18.0	73.0
Management Sciences	7.3	6.0	6.0	19.3
Mechanical & Mechatronics	26.0	7.0	17.0	50.0
Systems Design	9.0	10.3	4.0	23.3
TOTAL	109.5	73.8	62.5	245.8

New Faculty, 2009/10

Tenured and tenure-stream faculty hired October 1, 2008 – May 1, 2010

(A) by department and gender

Department	Male	Female	Total	%Women
Architecture	0.0	0.0	0.0	n/a
BET	0.0	0.0	0.0	n/a
Chemical	0.0	0.0	0.0	n/a
Civil & Environmental	3.0	0.0	3.0	0.0%
Electrical & Computer	6.0	2.0	8.0	25.0%
Management Sciences	0.0	2.0	2.0	100.0%
Mechanical & Mechatronics	3.0	0.0	3.0	0.0%
Systems Design	2.0	0.0	2.0	0.0%
TOTAL	14.0	4.0	18.0	22.2%

(B) by department and PhD school

Department	Waterloo	Ontario[1]	Canada[2]	USA	Int'l	Total
Architecture	0.0	0.0	0.0	0.0	0.0	0.0
BET	0.0	0.0	0.0	0.0	0.0	0.0
Chemical	0.0	0.0	0.0	0.0	0.0	0.0
Civil & Environmental	0.0	0.0	1.0	2.0	0.0	3.0
Electrical & Computer	0.0	0.0	2.0	6.0	0.0	8.0
Management Sciences	0.0	0.0	1.0	1.0	0.0	2.0
Mechanical & Mechatronics	0.0	0.0	0.0	3.0	0.0	3.0
Systems Design	1.0	0.0	0.0	1.0	0.0	2.0
TOTAL	1.0	0.0	4.0	13.0	0.0	18.0

NOTES:
1. Ontario excludes University of Waterloo.
2. Canada excludes Ontario.

(C) by department and rank

Department	Professor	Assoc.Prof.	Asst.Prof.	Total
Architecture	0.0	0.0	0.0	0.0
BET	0.0	0.0	0.0	0.0
Chemical	0.0	0.0	0.0	0.0
Civil & Environmental	0.0	0.0	3.0	3.0
Electrical & Computer	0.0	0.0	8.0	8.0
Management Sciences	0.0	0.0	2.0	2.0
Mechanical & Mechatronics	0.0	0.0	3.0	3.0
Systems Design	0.0	1.0	1.0	2.0
TOTAL	0.0	1.0	17.0	18.0

Changes to the Faculty Complement

October 1, 2008 - May 1, 2010

Department	New Hires	Retirements/Resignations
Architecture		Geoffrey Thun
BET	Douglas Sparkes	Jennifer Lynnes
Chemical		
Civil & Environmental	Bruce Macvicar	
	Robert Gracie	
	Shawn Matott	
	David Brush	
Electrical & Computer	Hiren Patel	William Wilson
	Dana Kulic	John Hamel
	Christopher Nielsen	Manjeri Anantram
	Bo Cui	Kostas Kontogiannis
	Mahesh Tripunitara	Todd Veldhuizen
	Lin Tan	Mohab Anis
	Shreyas Sundaram	
	Derek Rayside	
Management Sciences	Ada Barlatt	Scott Jeffrey
	Fatma Gzara	
Mechanical & Mechatronics	Soo Jeon	George Davidson
	Sean Peterson	
	Baris Fidan	
Systems Design	Arsen Hajian	
	Cameron Shelley[1]	
	Nasser Lashgarian Azad	

NOTE:
1. Centre for Society, Technology and Values (CSTV) faculty member.

Selected Major Faculty Awards and Honours

January - December, 2009

Department	Faculty Member	Award
Architecture	Philip Beesley	Canada Council selection for the Canada Pavilion at the 2010 Venice Biennale
	Geoff Thun	2009 Canada Council Professional Prix de Rome
	Kathy Velikov	2009 Canada Council Professional Prix de Rome
Chemical Engineering	Flora Ng	En-hui Yang Award for Engineering Research Innovation
	Mark Pritzker	2009 Wighton Fellowship
Civil & Environmental Engineering	Robert Gracie	2009 Melosh Medal
	Carl Haas	Canadian Academy of Engineering Fellow
	Ralph Haas	Lifetime Appointment as a National Associate of the National Academy of the United States
Electrical & Computer Engineering	Gordon Agnew	Canadian Academy of Engineering Fellow
	Mohab Anis	Early Researcher Award
	Savvas Chamberlain	Engineering Institute of Canada Fellow
	Savvas Chamberlain	Order of Canada
	Rob Gorbet	Canada Council selection for the Canada Pavilion at the 2010 Venice Biennale
	Karim Karim	Waterloo Engineering Research Excellence Award
	Omar Ramahi	Fellow of IEEE
	Sherman Shen	Fellow of IEEE
	Zhou Wang	Early Researcher Award
	En-Hui Yang	Canadian Academy of Engineering Fellow
	En-Hui Yang	Royal Society of Canada Fellow
Management Sciences	Miguel Anjos	Humboldt Fellowship
Mechanical & Mechatronics Engineering	Richard Culham	Waterloo Engineering Teaching Excellence Award
	Shahrzad Esmaeili	Early Researcher Award
	Carolyn Hansson	2009 Acta Materialia Award
	Carolyn Hansson	Royal Society of Canada Fellow
	Xianguo Li	Waterloo Engineering Research Excellence Award
	Alan Plumtree	Rio Tinto Alcan Award
	Gordon Stubley	University of Waterloo Distinguished Teacher Award
	Gordon Stubley	Ontario Confederation of University Faculty Associations University Teaching Award
Systems Design Engineering	Catherine Burns	Waterloo Engineering Research Excellence Award

FTE Staff, 2009/10

October 1, 2009 count date
Full-time equivalent positions paid from the operating budget

(A) by department and gender

Department	Male	Female	Total	% Women
Architecture	4.0	5.0	9.0	55.6%
BET	0.0	3.0	3.0	100.0%
Chemical	6.5	8.0	14.5	55.2%
Civil & Environmental	8.0	7.0	15.0	46.7%
Electrical & Computer	19.0	21.1	40.1	52.6%
Management Sciences	1.0	6.0	7.0	85.7%
Mechanical & Mechatronics	15.6	13.0	28.6	45.5%
Systems Design	4.0	4.0	8.0	50.0%
Dean's Office-administration	2.0	11.2	13.2	84.8%
Dean's Office-advancement	1.5	7.3	8.8	83.0%
Dean's Office-research institutes	2.0	3.0	5.0	60.0%
Undergraduate Office	2.0	9.5	11.5	82.6%
Undergraduate Office-PDEng	5.0	8.0	13.0	61.5%
Engineering Computing	8.0	2.0	10.0	20.0%
Engineering Machine Shop	10.0	0.5	10.5	4.3%
TOTAL	88.6	108.5	197.1	55.0%

(B) by department and type

Department	Tech.	Admin.	Total
Architecture	4.0	5.0	9.0
BET	0.0	3.0	3.0
Chemical	8.5	6.0	14.5
Civil & Environmental	8.0	7.0	15.0
Electrical & Computer	25.0	15.1	40.1
Management Sciences	1.0	6.0	7.0
Mechanical & Mechatronics	15.6	13.0	28.6
Systems Design	4.0	4.0	8.0
Dean's Office-administration	0.0	13.2	13.2
Dean's Office-advancement	0.0	8.8	8.8
Dean's Office-research institutes	0.0	5.0	5.0
Undergraduate Office	3.0	8.5	11.5
Undergraduate Office-PDEng	0.0	13.0	13.0
Engineering Computing	9.0	1.0	10.0
Engineering Machine Shop	8.0	2.5	10.5
TOTAL	86.1	111.0	197.1

Dean of Engineering Outstanding Staff Performance Award

Recipients since inception

Award Year	Award Recipient	Department
2007	Ken Bowman	Civil & Environmental
2007	Jeff Lederer	Architecture
2008	Linda Lyman	Dean of Engineering Office
2008	Terry Ridgway	Civil & Environmental
2009	Liz Bevan	Chemical
2009	Fred Bakker	Engineering Machine Shop

Faculty:Staff Ratios, 2009/10

October 1, 2009 count date
Total regular faculty to FTE staff paid from the operating budget

					Ratios		
Department	Admin Staff	Tech. Staff	Total Staff	Total Faculty	Faculty to Admin. Staff	Faculty to Tech. Staff	Faculty to Total Staff
Architecture	5.0	4.0	9.0	16.0	3.20	4.00	1.78
BET	3.0	0.0	3.0	3.0	1.00	n/a	1.00
Chemical	6.0	8.5	14.5	31.0	5.17	3.65	2.14
Civil & Environmental	7.0	8.0	15.0	35.3	5.04	4.41	2.35
Electrical & Computer	15.1	25.0	40.1	77.5	5.13	3.10	1.93
Management Sciences	6.0	1.0	7.0	20.3	3.38	20.25	2.89
Mechanical & Mechatronics	13.0	15.6	28.6	51.0	3.92	3.27	1.78
Systems Design	4.0	4.0	8.0	25.3	6.33	6.33	3.16
Support Units	51.9	20.0	71.9	1.0	n/a	n/a	n/a
TOTAL	111.0	86.1	197.1	260.3	2.35	3.02	1.32

Five-year Comparison of Regular Faculty

October 1[1] count by department, with % women
Excludes definite-term professors[2], research professors and visitors

	Total Regular Faculty					% Women				
Department	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
Architecture	15	16	18	17	16	12.9%	24.2%	33.3%	35.3%	37.5%
BET	n/a	2	2	2.5	3	n/a	33.3%	24.7%	19.7%	0%
Chemical	25	26	29	31	31	11.5%	11.5%	10.3%	6.5%	6.5%
Civil & Environmental	31	32	32.3	31.3	35.3	12.9%	15.2%	12.4%	9.6%	8.5%
Electrical & Computer	64.5	68.5	75.5	75.5	77.5	10%	8.6%	7.9%	7.9%	10.3%
Management Sciences	16	18	18.3	19.3	20.3	12.5%	16.7%	16.4%	15.6%	24.7%
Mechanical & Mechatronics	38	42	44	49	51	17.5%	16.3%	17.8%	18.4%	17.6%
Systems Design	19.3	20.3	23.3	22.30	25.3	10%	9.5%	17.2%	17.9%	15.8%
Support Unit Offices	2	1	1	1	1	0%	0%	0%	0%	0%
TOTAL	210.8	225.8	243.3	248.8	260.3	12.3%	13.3%	14.1%	13.4%	14.2%

NOTES:
1. 2009 faculty count is as of May 1, 2010.
2. Starting in 2007, definite term professors are excluded from regular faculty counts. Previous years' data have been restated.

Five-year Comparison of Tenured/Tenure-Stream Faculty

October 1[1] count by department, with % women
Excludes lecturers, definite-term, research and visiting professors[2]

	Total Tenured/Tenure-Stream Faculty					% Women				
Department	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
Architecture	14	15	17	16	15	14.3%	26.7%	35.3%	37.5%	40%
BET	n/a	1	0.5	1.5	1	n/a	50%	100%	32.9%	0%
Chemical	25	26	29	31	31	11.5%	11.5%	10.3%	6.5%	6.5%
Civil & Environmental	30	31	31.3	30.3	33.3	13.3%	16.1%	12.8%	9.9%	9%
Electrical & Computer	60	62.5	71	71	73	10%	9.6%	8.4%	8.5%	11%
Management Sciences	15	17	18.3	17.3	19.3	13.3%	17.7%	16.4%	17.4%	26%
Mechanical & Mechatronics	38	42	42	48	50	18.4%	16.7%	19.0%	18.8%	18%
Systems Design	17.3	18.3	21.3	21.3	23.3	11.6%	10.9%	18.8%	18.8%	17.2%
Support Unit Offices	1	1	0	0	0	0%	0%	0%	0%	0%
TOTAL	200.3	213.8	230.3	236.3	245.8	13.0%	14.3%	15.0%	14.2%	15.1%

NOTES:
1. 2009 faculty count is as of May 1, 2010.
2. Starting in 2007, definite term professors are excluded from regular faculty counts. Previous years' data have been restated.

Five-year Comparison of FTE Staff

October 1 count of full-time equivalent positions paid from the operating budget

	FTE Staff				
Department	2005	2006	2007	2008	2009
Architecture	9.7	9.7	10.7	8.6	9
BET	n/a	2	3	3	3
Chemical	13.5	14	16	15.5	14.5
Civil & Environmental	14.5	14.5	16	15.3	15
Electrical & Computer	31.5	32.5	34	36.1	40.1
Management Sciences	3.4	3.4	3.9	6.5	7
Mechanical & Mechatronics	21.6	24.6	24.8	27.6	28.6
Systems Design	8.5	8	9	8	8
Dean's Office-administration	10.7	10.7	10.7	11.2	13.2
Dean's Office-advancement	8	6	8	9.3	8.8
Dean’s Office-research institutes	n/a	n/a	n/a	3	5
Undergraduate Office	8	11	11	11	11.5
Undergraduate Office - PDEng	n/a	2	13	14	13
Engineering Computing	11	11	11	10	10
Engineering Machine Shop	10	10.5	11	10.5	10.5
TOTAL	150.4	159.9	182.1	189.6	197.1

Five-year Comparison of Faculty:Staff Ratios

October 1[1] count of total regular faculty to FTE staff paid from operating

	Faculty to Admin. Staff					Faculty to Tech. Staff					Faculty to Total Staff				
Department	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
Architecture	2.5	1.78	2.57	3.4	3.2	4.05	23.88	4.9	4.72	4	1.55	1.65	1.69	1.98	1.78
BET	n/a	0.99	0.66	0.83	1	n/a	n/a	n/a	n/a	n/a	n/a	0.99	0.66	0.83	1
Chemical	4.17	4.33	4.14	4.43	5.17	3.33	3.25	3.22	3.65	3.65	1.85	1.86	1.81	2	2.14
Civil & Environmental	5.17	5.33	3.58	4.28	5.04	3.65	3.76	4.61	3.91	4.41	2.14	2.21	2.02	2.04	2.35
Electrical & Computer	5.61	5.48	5.39	4.69	5.13	3.23	3.43	3.78	3.78	3.10	2.05	2.11	2.22	2.09	1.93
Management Sciences	5.33	6	5.21	3.5	3.38	40	45	45.63	19.25	20.25	4.71	5.29	4.68	2.96	2.89
Mechanical & Mechatronics	4.75	5.25	3.44	3.77	3.92	2.79	3.09	3.67	3.36	3.27	1.76	1.94	1.77	1.78	1.78
Systems Design	4.29	5.08	4.66	5.58	6.33	4.83	5.08	5.83	5.58	6.33	2.27	2.54	2.59	2.79	3.16
TOTAL[2]	2.96	2.76	2.30	2.19	2.35	2.66	3.00	3.20	3.29	3.02	1.40	1.44	1.34	1.31	1.32

NOTES:
1. 2009 faculty count is as of May 1, 2010.
2. Total includes support units. (e.g. Dean's Office, Undergraduate Office, Engineering Computing, Machine Shop, etc.)

B. UNDERGRADUATE STUDIES DATA

Undergraduate Enrolment, Fall 2009

November 1, 2009 count date
Includes students on official co-op work term

(A) by program and gender

Program	Male	Female	Total	% Women
Architecture	157	189	346	54.6%
Chemical	395	204	599	34.1%
Civil	390	114	504	22.6%
Computer	518	53	571	9.3%
Electrical	815	85	901	9.4%
Environmental	92	93	185	50.3%
Geological	55	18	73	24.7%
Management	109	49	158	31.0%
Mechanical	768	64	832	7.7%
Mechatronics	488	34	522	6.5%
Nanotechnology	352	87	439	19.8%
Software	404	38	442	8.6%
Systems Design	275	95	370	25.7%
TOTAL	4818	1123	5942	18.9%

(B) by program and visa status

Program	Canadian	Visa	Total	% Visa
Architecture	337	9	346	2.6%
Chemical	543	56	599	9.3%
Civil	461	43	504	8.5%
Computer	530	41	571	7.2%
Electrical	835	66	901	7.3%
Environmental	175	10	185	5.4%
Geological	71	2	73	2.7%
Management	142	16	158	10.1%
Mechanical	789	43	832	5.2%
Mechatronics	480	42	522	8.0%
Nanotechnology	422	17	439	3.9%
Software	419	23	442	5.2%
Systems Design	363	7	370	1.9%
TOTAL	5567	375	5942	6.3%

NOTE:
1. Chemical & Civil include 23 total students in the first class at Waterloo's UAE campus.

Undergraduate FTE Enrolment, 2009/10

(A) by program and gender

Program	Male	Female	Total	% Women
Architecture	122.7	153.3	276.0	55.5%
Chemical	318	162.8	480.8	33.9%
Civil	304.9	91.9	396.8	23.2%
Computer	404.1	43.8	447.9	9.8%
Electrical	648.7	69.4	718.1	9.7%
Environmental	69.3	71.4	140.7	50.7%
Geological	46.5	15.4	61.9	24.9%
Management	93.3	37	130.3	28.4%
Mechanical	625.3	52.9	678.2	7.8%
Mechatronics	380.3	29.8	410.1	7.3%
Nanotechnology	281.7	69.9	351.6	19.9%
Software	321	30.8	351.8	8.8%
Systems Design	222.4	74.1	296.5	25.0%
TOTAL	3838.2	902.5	4740.7	19.0%

(B) by program and visa status

Program	Canadian	Visa	Total	% Visa
Architecture	269.5	6.5	276.0	2.4%
Chemical	438	42.8	480.8	8.9%
Civil	361.3	35.5	396.8	8.9%
Computer	418.9	29	447.9	6.5%
Electrical	669.5	48.6	718.1	6.8%
Environmental	134.2	6.5	140.7	4.6%
Geological	60.9	1	61.9	1.6%
Management	117.3	13	130.3	10.0%
Mechanical	645.1	33.1	678.2	4.9%
Mechatronics	379.6	30.5	410.1	7.4%
Nanotechnology	338.6	13	351.6	3.7%
Software	334.3	17.5	351.8	5.0%
Systems Design	291	5.5	296.5	1.9%
TOTAL	4458.2	282.5	4740.7	6.0%

NOTES:
1. FTE = (spring 2009 + fall 2009 + winter 2010, excluding students on co-op)/2
2. Chemical & Civil include 23 total students in the first class at Waterloo's UAE campus.

Undergraduate Degrees Granted, 2009

Degrees granted at 2009 convocations
Includes BASc, BArch, BSE and BAS degrees

(A) by program and gender

Program	Male	Female	Total	% Women
Architecture	31	33	64	51.6%
Chemical	54	30	84	35.7%
Civil	66	18	84	21.4%
Computer	134	10	144	6.9%
Electrical	83	9	92	9.8%
Environmental	13	7	20	35.0%
Geological	11	2	13	15.4%
Mechanical	117	17	134	12.7%
Mechatronics	79	9	88	10.2%
Software	49	3	52	5.8%
Systems Design	57	17	74	23.0%
TOTAL	694	155	849	18.3%

(B) by program and visa status

Program	Canadian	Visa	Total	% Visa
Architecture	64	0	64	0.0%
Chemical	81	3	84	3.6%
Civil	83	1	84	1.2%
Computer	138	6	144	4.2%
Electrical	90	2	92	2.2%
Environmental	19	1	20	5.0%
Geological	12	1	13	7.7%
Mechanical	132	2	134	1.5%
Mechatronics	83	5	88	5.7%
Software	49	3	52	5.8%
Systems Design	72	2	74	2.7%
TOTAL	823	26	849	3.1%

Undergraduate Students:Faculty Ratio, 2009/10

Undergraduate FTE to Total Regular Faculty Members, 2009/10

Department	Undergraduate FTE	Regular Faculty	Student:Faculty
Architecture	276.0	16.0	17.3
BET	0.0	3.0	n/a
Chemical	598.6	31.0	19.3
Civil & Environmental	599.4	35.3	17.0
Electrical & Computer	1541.7	77.5	19.9
Management Sciences	130.3	20.3	6.4
Mechanical & Mechatronics	924.3	51.0	18.1
Systems Design	378.5	22.3	17.0
Other Faculty Offices	0.0	1.0	n/a
TOTAL	4448.8	257.3	17.3

NOTES:
Undergraduate FTE = (spring+fall+winter registrations, excluding students on co-op)/2

Total of FTE by department is lower than total of FTE by program because ½ Software and ⅓ Nanotechnology are outside the Faculty of Engineering.

Students in joint programs are allocated to departments as follows:
Software = ½ E&CE (remaining ½ if is Math Faculty)
Mechatronics = 3/5 MME, 1/5 to SDE, 1/5 to ECE
Nanotechnology = ⅓ to Chem, ⅓ to E&CE (remaining ⅓ is in Science Faculty)

Total Regular faculty members = as of May 1, 2010, excluding definite-term, visiting and research professors.

Systems Design faculty here excludes 3 Centre for Society, Technology, and Values faculty.

Undergraduate Year One New Admissions: Performance to Target, Fall 2009

November 1, 2009 count date
Includes students on official co-op work term

	TARGET			ACTUAL			% OF TARGET	
Program	Cdn/PR	Int'l	Total	Cdn/PR	Int'l	Total	% of total	% of intern'l
Architecture	62	10	72	73	1	74	102.8%	10.0%
Chemical	115	15	130	108	22	130	100.0%	146.7%
Civil	95	10	105	103	23	126	120.0%	230.0%
Electrical & Computer	300	30	330	306	39	345	104.5%	130.0%
Environmental	45	3	48	47	4	51	106.3%	133.3%
Geological	15	2	17	15	2	17	100.0%	100.0%
Management	55	5	60	64	8	72	120.0%	160.0%
Mechanical	180	15	195	187	17	204	104.6%	113.3%
Mechatronics	100	10	110	107	15	122	110.9%	150.0%
Nanotechnology	100	10	110	95	4	99	90.0%	40.0%
Software	100	10	110	106	8	114	103.6%	80.0%
Systems Design	90	0	90	80	3	83	92.2%	n/a
TOTAL	1257	120	1377	1291	146	1437	104.4%	121.7%

NOTE:
1. Chemical & Civil include 23 total students in the first class at Waterloo's UAE campus.

Co-op Employment Statistics, 2009

Discipline	Seeking Employment	Employed	Unemployed	% Employed
Winter 2009				
Architecture	152	148	4	97.4%
Chemical	247	236	11	95.5%
Civil	169	168	1	99.4%
Computer	239	236	3	98.7%
Electrical	336	321	15	95.5%
Environmental	82	79	3	96.3%
Geological	30	28	2	93.3%
Management	39	39	0	100.0%
Mechanical	331	317	14	95.8%
Mechatronics	211	200	11	94.8%
Nanotechnology	238	235	3	98.7%
Systems Design	159	156	3	98.1%
Software	160	160	0	100.0%
Winter 2009 Total	2393	2323	70	97.1%
Spring 2009				
Architecture	117	114	3	97.4%
Chemical	217	195	22	89.9%
Civil	204	195	9	95.6%
Computer	89	86	3	96.6%
Electrical	281	258	23	91.8%
Environmental	51	47	4	92.2%
Geological	19	19	0	100.0%
Management	52	47	5	90.4%
Mechanical	299	254	45	84.9%
Mechatronics	172	163	9	94.8%
Nanotechnology	170	165	5	97.1%
Systems Design	132	129	3	97.7%
Software	194	182	12	93.8%
Spring 2009 Total	1997	1854	143	92.8%

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Co-op Employment Statistics, 2009

continued

Discipline	Seeking Employment	Employed	Unemployed	% Employed
Fall 2009				
Architecture	62	61	1	98.4%
Chemical	233	230	3	98.7%
Civil	158	155	3	98.1%
Computer	325	321	4	98.8%
Electrical	399	393	6	98.5%
Environmental	74	74	0	100.0%
Geological	31	31	0	100.0%
Management	40	39	1	97.5%
Mechanical	297	285	12	96.0%
Mechatronics	209	205	4	98.1%
Nanotechnology	78	78	0	100.0%
Systems Design	156	154	2	98.7%
Software	137	137	0	100.0%
Fall 2009 Total	2199	2163	36	98.4%
2009 TOTAL (all terms)	6589	6340	249	96.2%

Co-op Employment Location Statistics, 2009

Program	Ontario	Canada	Int'l	Total
Winter 2009				
Architecture	95	29	24	
Chemical Engineering	190	39	7	
Civil Engineering	145	14	9	
Computer Engineering	202	6	28	
Electrical Engineering	276	15	30	
Environmental Engineering	65	8	6	
Geological Engineering	15	13	0	
Management	33	3	3	
Mechanical Engineering	277	29	11	
Mechatronics	174	8	18	
Nanotechnology Engineering	38	168	29	
Software Engineering	110	14	36	
Systems Design Engineering	128	12	16	
Winter 2009 Total	1748	358	217	2323
Spring 2009				
Architecture	67	18	29	
Chemical Engineering	156	24	15	
Civil Engineering	153	17	25	
Computer Engineering	76	3	7	
Electrical Engineering	219	11	28	
Environmental Engineering	34	7	6	
Geological Engineering	18	1	0	
Management	39	1	7	
Mechanical Engineering	216	15	23	
Mechatronics	146	0	17	
Nanotechnology Engineering	134	14	17	
Software Engineering	143	6	33	
Systems Design Engineering	100	4	25	
Spring 2009 Total	1501	121	232	1854

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Co-op Employment Location Statistics, 2009

continued

Program	Ontario	Canada	Int'l	Total
Fall 2009				
Architecture	40	5	16	
Chemical Engineering	197	25	8	
Civil Engineering	137	13	5	
Computer Engineering	258	22	41	
Electrical Engineering	337	21	35	
Environmental Engineering	63	8	3	
Geological Engineering	25	6	0	
Management	37	2	0	
Mechanical Engineering	249	21	15	
Mechatronics	184	7	14	
Nanotechnology Engineering	62	9	7	
Software Engineering	100	8	29	
Systems Design Engineering	130	11	13	
Fall 2009 Total	1819	158	186	2163
2009 TOTAL	5068	637	635	6340
2009 PERCENTAGE	79.9%	10.0%	10.0%	-

Five-year Comparison of Undergraduate Enrolment

November 1 count date, including students on official co-op work term

(A) by program, with % women

	Total Enrolment					% Women				
Program	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
Architecture	329	342	339	348	346	57.8%	55.8%	56.6%	56.9%	54.6%
Chemical 1	516	559	568	584	599	35.7%	32.6%	33.1%	34.2%	34.1%
Civil 1	427	456	457	470	504	24.8%	23.9%	24.3%	24%	22.6%
Computer	805	749	671	623	571	8.4%	8.4%	8.3%	9.3%	9.3%
Electrical	639	688	750	826	901	14.7%	13.7%	9.7%	8.6%	9.4%
Environmental	178	160	150	163	185	41%	42.5%	42.7%	46%	50.3%
Geological	70	66	75	76	73	21.4%	22.7%	21.3%	23.7%	24.7%
Management	n/a	n/a	81	107	158	n/a	n/a	23.5%	29%	31%
Mechanical	842	851	844	830	832	10.8%	9%	8.6%	8.6%	7.7%
Mechatronics	333	420	514	531	522	9.9%	9.5%	8.2%	7.7%	6.5%
Nanotechnology	106	195	279	358	439	14.2%	16.9%	17.2%	18.4%	19.8%
Software	443	438	411	422	442	12.4%	11%	10.5%	8.8%	8.6%
Systems Design	421	417	389	382	370	28%	25.2%	22.9%	22.3%	25.7%
TOTAL	5109	5341	5528	5720	5942	20.4%	19.2%	18.3%	18.6%	18.9%

NOTE:

1. In 2009, Chemical & Civil Engineering include 23 total students in the first class at Waterloo's UAE campus.

Five-year Comparison of Undergraduate Enrolment

November 1 count date, including students on official co-op work term

(B) by program, with % visa

	Total Enrolment					% Visa				
Program	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
Architecture	329	342	339	348	346	3%	3.5%	3.8%	2.9%	2.6%
Chemical 1	516	559	568	584	599	2.9%	4.3%	5.5%	7.9%	9.3%
Civil 1	427	456	457	470	504	2.1%	2.9%	3.9%	4.7%	8.5%
Computer	805	749	671	623	571	2.9%	4%	5.1%	5.9%	7.2%
Electrical	639	688	750	826	901	2.2%	4.9%	5.5%	5.9%	7.3%
Environmental	178	160	150	163	185	1.7%	3.8%	4.7%	4.3%	5.4%
Geological	70	66	75	76	73	5.7%	7.6%	4%	1.3%	2.7%
Management	n/a	n/a	81	107	158	n/a	n/a	11.1%	10.3%	10.1%
Mechanical	842	851	844	830	832	2.4%	2.9%	4%	4.1%	5.2%
Mechatronics	333	420	514	531	522	5.4%	6.7%	5.6%	6.6%	8%
Nanotechnology	106	195	279	358	439	3.8%	5.1%	5.4%	4.2%	3.9%
Software	443	438	411	422	442	2.5%	4.1%	4.6%	5.7%	5.2%
Systems Design	421	417	389	382	370	1%	1.4%	1.8%	2.1%	1.9%
TOTAL	5109	5341	5528	5720	5942	2.6%	4.0%	4.7%	5.2%	6.3%

NOTE:

1. In 2009, Chemical & Civil Engineering include 23 total students in the first class at Waterloo's UAE campus.

Five-Year Comparison of Undergraduate Year One New Admissions: Performance to Target

November 1 count date

(A) performance to total student target

Program	2005	2006	2007	2008	2009
Architecture	95.8%	122.2%	91.7%	118.6%	102.8%
Chemical	101.6%	107.2%	100.8%	101.5%	100%
Civil	95%	121%	105%	106.7%	120%
Electrical & Computer	104.1%	109.2%	100.3%	109.4%	104.5%
Environmental	105.3%	115.8%	102.6%	131.6%	106.3%
Geological	117.7%	117.7%	141.2%	105.9%	100%
Management	n/a	n/a	135%	111.7%	120%
Mechanical	99.5%	103.7%	98.4%	100%	104.6%
Mechatronics	107.3%	100.9%	104.6%	112.7%	110.9%
Nanotechnology	106%	101.8%	99.1%	99.1%	90%
Software	104.8%	112.2%	100%	107.3%	103.6%
Systems Design	98.7%	95.6%	93.3%	105.6%	92.2%
TOTAL	102.1%	108.1%	101.8%	107.3%	104.4%

Five-Year Comparison of Undergraduate Year One New Admissions: Performance to Target

November 1 count date

(B) performance to international student target

Program	2005	2006	2007	2008	2009
Architecture	85.7%	50%	30%	30%	10%
Chemical	70%	120%	100%	106.7%	146.7%
Civil	100%	120%	140%	110%	230%
Electrical & Computer	75%	124%	90%	83.3%	130%
Environmental	33.3%	133%	133.3%	100%	133.3%
Geological	150%	100%	0%	0%	100%
Management	n/a	n/a	180%	120%	160%
Mechanical	100%	80%	150%	73.3%	113.3%
Mechatronics	120%	100%	90%	120%	150%
Nanotechnology	80%	100%	110%	70%	40%
Software	80%	142.9%	80%	70%	80%
Systems Design	n/a	n/a	n/a	n/a	n/a
TOTAL	89.6%	108.9%	100%	80.8%	121.7%

Five-year Comparison of Undergraduate Degrees Granted

Degrees granted at spring and fall convocation by program | BASc, BArch, BSE and BAS degrees

	Total UG Degrees					% Women				
Program	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
Architecture	79	63	59	66	64	45.6%	49.2%	66.1%	62.1%	51.6%
Chemical	62	62	89	99	84	62.9%	48.4%	42.7%	29.3%	35.7%
Civil	69	78	73	83	84	15.9%	23.1%	28.8%	28.9%	21.4%
Computer	242	130	158	162	144	13.2%	8.5%	13.3%	8.6%	6.9%
Electrical	94	116	92	95	92	16.0%	15.5%	26.1%	18.9%	9.8%
Environmental	46	42	37	26	20	43.5%	40.5%	48.6%	46.2%	35%
Geological	12	11	10	12	13	50%	36.4%	10%	33.3%	15.4%
Mechanical	138	148	154	165	134	13%	16.9%	12.3%	7.9%	12.7%
Mechatronics	n/a	n/a	n/a	92	88	n/a	n/a	n/a	12%	10.2%
Software	n/a	80	103	89	52	n/a	11.3%	11.7%	15.7%	5.8%
Systems Design	73	80	79	85	74	32.9%	38.8%	35.4%	25.9%	23%
TOTAL	815	810	854	974	849	24.7%	24%	25.9%	20.7%	18.3%

Five-year Comparison of Undergraduate Student:Faculty Ratios

Undergraduate FTE to total regular faculty members

	UG Student to Faculty Ratio				
Department	2005	2006	2007	2008	2009
Architecture	19.3	17.4	15.6	15.9	17.3
Chemical	16.4	17.1	17.4	16.9	19.3
Civil & Environmental	16.9	16.8	17.4	17.3	17.0
Electrical & Computer	21.9	19.8	19.2	19.3	19.9
Management	n/a	n/a	n/a	3.9	6.4
Mechanical & Mechatronics	20.0	19.2	19.8	19.1	18.1
Systems Design	21.4	21.2	18.7	20.0	17.0
TOTAL	18.0	17.0	16.8	17.1	17.3

C. GRADUATE STUDIES DATA

Graduate Enrolment, Fall 2009

November 1, 2009 count date, including full- and part-time students

(A) by department and gender

Department	Male	Female	Total	% Women
Architecture	73	74	147	50.3%
BET	81	37	118	31.4%
Chemical	106	54	160	33.8%
Civil & Environmental	182	55	237	23.2%
Electrical & Computer	453	87	540	16.1%
Management Sciences	151	68	219	31.1%
Mechanical & Mechatronics	247	44	291	15.1%
Systems Design	82	23	105	21.9%
TOTAL	1375	442	1817	24.3%

(B) by department and visa status

Department	Cdn/PR	Visa	Total	% Visa
Architecture	140	7	147	4.8%
BET	45	73	118	61.9%
Chemical	92	68	160	42.5%
Civil & Environmental	171	66	237	27.8%
Electrical & Computer	343	197	540	36.5%
Management Sciences	170	49	219	22.4%
Mechanical & Mechatronics	229	62	291	21.3%
Systems Design	71	34	105	32.4%
TOTAL	1261	556	1817	30.6%

(C) by department and degree type

Department	PhD	Research Master	Profess'l Master	Non-Degree[1]	Total
Architecture	n/a	144	n/a	3	147
BET	n/a	n/a	62	56	118
Chemical	84	59	17	n/a	160
Civil & Environmental	89	85	60	3	237
Electrical & Computer	264	132	140	4	540
Management Sciences	31	33	153	2	219
Mechanical & Mechatronics	105	115	69	2	291
Systems Design	56	33	11	5	105
TOTAL	629.0	601.0	512.0	75.0	1817.0

NOTE:

1. Non-degree includes diploma and certificate programs.

FTE Graduate Enrolment, Fall 2009

November 1, 2009 FTE enrolment

(A) by department and gender, excluding non-degree[1] programs

Department	Male	Female	Total	% Women
Architecture	62.6	63.9	126.5	50.5%
BET	41.7	13.3	55.0	24.2%
Chemical	99.7	52.6	152.3	34.5%
Civil & Environmental	161.1	49.8	210.9	23.6%
Electrical & Computer	365	69.5	434.5	16.0%
Management Sciences	94.4	49.8	144.2	34.5%
Mechanical & Mechatronics	211.4	36.3	247.7	14.7%
Systems Design	75.2	20.6	95.8	21.5%
TOTAL	1111.1	355.8	1466.9	24.3%

(B) by department and visa status, excluding non-degree[1] programs

Department	Cdn/PR	Visa	Total	% Visa
Architecture	122.5	4.0	126.5	3.2%
BET	38.0	17.0	55.0	30.9%
Chemical	84.3	68.0	152.3	44.6%
Civil & Environmental	146.9	64.0	210.9	30.3%
Electrical & Computer	246.4	188.4	434.5	43.4%
Management Sciences	99.3	44.9	144.2	31.1%
Mechanical & Mechatronics	188.1	59.3	247.7	23.9%
Systems Design	66.8	29.0	95.8	30.3%
TOTAL	992.3	474.6	1466.9	32.4%

(C) by department and degree type, including non-degree[1] programs

Department	PhD	Research Master	Profess'l Master	Non-Degree[1]	Total
Architecture	n/a	126.5	n/a	3.0	129.5
BET	n/a	n/a	55.0	56.0	111.0
Chemical	80.5	56.9	14.9	0.0	152.3
Civil & Environmental	82.7	79.4	48.8	2.3	213.2
Electrical & Computer	247.2	112.4	74.9	2.6	437.1
Management Sciences	26.1	29.5	88.6	2.0	146.2
Mechanical & Mechatronics	96.6	106.6	44.5	2.0	249.7
Systems Design	55.3	31.6	8.9	5.0	100.8
TOTAL	588.4	542.9	335.6	72.9	1539.8

NOTES:
1. Non-degree includes diploma and certificate programs.
2. FTE enrolment = FT + (PT*0.3)

Graduate Degrees Granted, 2009

Degrees granted at 2009 convocations
Includes MArch, MASc, MBET, MMSc, MEng and PhD degrees

(A) by department and gender

Department	Male	Female	Total	% Women
Architecture	9	23	32	71.9%
BET	18	24	42	57.1%
Chemical	28	13	41	31.7%
Civil & Environmental	59	8	67	11.9%
Electrical & Computer	102	19	121	15.7%
Management Sciences	45	20	65	30.8%
Mechanical & Mechatronics	50	10	60	16.7%
Systems Design	14	6	20	30.0%
TOTAL	325	123	448	27.5%

(B) by department and visa status

Department	Cdn/PR	Visa	Total	% Visa
Architecture	32	0	32	0.0%
BET	26	16	42	38.1%
Chemical	31	10	41	24.4%
Civil & Environmental	60	7	67	10.4%
Electrical & Computer	93	28	121	23.1%
Management Sciences	48	17	65	26.2%
Mechanical & Mechatronics	57	3	60	5.0%
Systems Design	16	4	20	20.0%
TOTAL	363	85	448	19.0%

(C) by degree

Degree	Total
MArch	32
MASc	151
MBET	42
MMSc	45
MEng	82
PhD	96
TOTAL	448

Graduate Students:Faculty Ratio, 2009/10

November 1, 2009 FTE enrolment to tenured/tenure-stream faculty May 1, 2010

Department	Degree Type	FTE Students	T/TS Faculty	Ratio
Architecture	PhD	0.0	15.0	0.0
	Master - research	126.5	15.0	8.4
	Master - professional	0.0	15.0	0.0
	Non-degree students	3.0	15.0	0.2
	All research students	126.5	15.0	8.4
	All students	129.5	15.0	8.6
Business, Entrepreneurship & Technology	PhD	0.0	1.0	0.0
	Master - research	0.0	1.0	0.0
	Master - professional	55.0	1.0	55.0
	Non-degree students	56.0	1.0	56.0
	All research students	0.0	1.0	0.0
	All students	111.0	1.0	111.0
Chemical Engineering	PhD	80.5	31.0	2.6
	Master - research	56.9	31.0	1.8
	Master - professional	14.9	31.0	0.5
	Non-degree students	0.0	31.0	0.0
	All research students	137.4	31.0	4.4
	All students	152.3	31.0	4.9
Civil & Environmental Engineering	PhD	82.7	33.3	2.5
	Master - research	79.4	33.3	2.4
	Master - professional	48.8	33.3	1.5
	Non-degree students	2.3	33.3	0.1
	All research students	162.1	33.3	4.9
	All students	213.2	33.3	6.4
Electrical & Computer Engineering	PhD	247.2	73.0	3.4
	Master - research	112.4	73.0	1.5
	Master - professional	74.9	73.0	1.0
	Non-degree students	2.6	73.0	0.0
	All research students	359.6	73.0	4.9
	All students	437.1	73.0	6.0

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Graduate Students:Faculty Ratio, 2009/10

continued

Department	Degree Type	FTE Students	T/TS Faculty	Ratio
Management Sciences	PhD	26.1	19.3	1.4
	Master - research	29.5	19.3	1.5
	Master - professional	88.6	19.3	4.6
	Non-degree students	2.0	19.3	0.1
	All research students	55.6	19.3	2.9
	All students	146.2	19.3	7.6
Mechanical & Mechatronics Engineering	PhD	96.6	50.0	1.9
	Master - research	106.6	50.0	2.1
	Master - professional	44.5	50.0	0.9
	Non-degree students	2.0	50.0	0.0
	All research students	203.2	50.0	4.1
	All students	249.7	50.0	5.0
Systems Design Engineering	PhD	55.3	23.3	2.4
	Master - research	31.6	23.3	1.4
	Master - professional	8.9	23.3	0.4
	Non-degree students	5.0	23.3	0.2
	All research students	86.9	23.3	3.7
	All students	100.8	23.3	4.3
Faculty of Engineering TOTAL	PhD	588.4	245.8	2.4
	Master - research	542.9	245.8	2.2
	Master - professional	335.6	245.8	1.4
	Non-degree students	72.9	245.8	0.3
	All research students	1131.3	245.8	4.6
	All students	1539.8	245.8	6.3

FTE Graduate Enrolment, Fall 2009: Performance to Target

November 1, 2009 FTE enrolment: FT+(PT*0.3)

		TARGET			ACTUAL			% OF TARGET	
Department	Degree Type	CPR	Int'l	Total	CPR	Intl	Total	% of total	% of CPR
Architecture	PhD	0.0	0.0	0.0	0.0	0.0	0.0	n/a	n/a
	Master - research	100.0	13.0	113.0	122.5	4.0	126.5	111.9%	122.5%
	Master - professional	0.0	0.0	0.0	0.0	0.0	0.0	n/a	n/a
	TOTAL	100.0	13.0	113.0	122.5	4.0	126.5	111.9%	122.5%
Business, Entrepreneurship & Technology	PhD	0.0	0.0	0.0	0.0	0.0	0.0	n/a	n/a
	Master - research	0.0	0.0	0.0	0.0	0.0	0.0	n/a	n/a
	Master - professional	30.0	20.0	50.0	38.0	17.0	55.0	110.0%	126.7%
	TOTAL	30.0	20.0	50.0	38.0	17.0	55.0	110.0%	126.7%
Chemical Engineering	PhD	34.3	46.7	81.0	30.5	50.0	80.5	99.4%	88.9%
	Master - research	58.0	11.0	69.0	38.9	18.0	56.9	82.5%	67.1%
	Master - professional	10.0	0.0	10.0	14.9	0.0	14.9	149.0%	149.0%
	TOTAL	102.3	57.7	160.0	84.3	68.0	152.3	95.2%	82.4%
Civil & Environmental Engineering	PhD	40.0	40.0	80.0	44.7	38.0	82.7	103.4%	111.8%
	Master - research	62.0	14.0	76.0	53.4	26.0	79.4	104.5%	86.1%
	Master - professional	70.0	0.0	70.0	48.8	0.0	48.8	69.7%	69.7%
	TOTAL	172.0	54.0	226.0	146.9	64.0	210.9	93.3%	85.4%
Electrical & Computer Engineering	PhD	135.0	135.0	270.0	122.6	124.6	247.2	91.6%	90.8%
	Master - research	90.0	62.0	152.0	65.8	46.6	112.4	73.9%	73.1%
	Master - professional	19.0	0.0	19.0	57.7	17.2	74.9	394.2%	303.7%
	TOTAL	244.0	197.0	441.0	246.1	188.4	434.5	98.5%	100.9%

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FTE Graduate Enrolment, Fall 2009: Performance to Target

continued

		TARGET			ACTUAL			% OF TARGET	
Department	Degree Type	CPR	Int'l	Total	CPR	Intl	Total	% of total	% of CPR
Management Sciences	PhD	22.0	8.0	30.0	18.1	8.0	26.1	87.0%	82.3%
	Master - research	22.0	8.0	30.0	18.5	11.0	29.5	98.3%	84.1%
	Master - professional	50.0	20.0	70.0	62.7	25.9	88.6	126.6%	125.4%
	TOTAL	94.0	36.0	130.0	99.3	44.9	144.2	110.9%	105.6%
Mechanical & Mechatronics Engineering	PhD	50.0	40.0	90.0	52.3	44.3	96.6	107.3%	104.6%
	Master - research	90.0	10.0	100.0	92.6	14.0	106.6	106.6%	102.9%
	Master - professional	35.0	0.0	35.0	43.5	1.0	44.5	127.1%	124.3%
	TOTAL	175.0	50.0	225.0	188.4	59.3	247.7	110.1%	107.7%
Systems Design Engineering	PhD	35.0	16.0	51.0	36.3	19.0	55.3	108.4%	103.7%
	Master - research	32.0	5.0	37.0	26.6	5.0	31.6	85.4%	83.1%
	Master - professional	5.0	0.0	5.0	3.9	5.0	8.9	178.0%	78.0%
	TOTAL	72.0	21.0	93.0	66.8	29.0	95.8	103.0%	92.8%
Faculty of Engineering TOTAL	PhD	316.3	285.7	602.0	304.5	283.9	588.4	97.7%	96.3%
	Master - research	454.0	123.0	577.0	418.3	124.6	542.9	94.1%	92.1%
	Master - professional	219.0	40.0	259.0	269.5	66.1	335.6	129.6%	123.1%
	TOTAL	989.3	448.7	1438.0	992.3	474.6	1466.9	102.0%	100.3%

NOTES:

1. Fall term FTE = November 1, 2009 enrolment: FT+(PT*0.3)
2. In Target, Master-professional includes original Master-professional and Master-cost recovery programs.
3. Total excludes non-degree, certificate and diploma students, for which targets were not set in Vision 2010 plan.

Five-year Comparison of Graduate Enrolment

November 1 count date, including full- and part-time students

(A) by department, with % women

Department	Total Enrolment					% Women				
	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
Architecture	65	73	106	131	147	56.9%	50.7%	50.0%	51.1%	50.3%
BET	n/a	33	46	66	118	n/a	33.3%	39.1%	39.4%	31.4%
Chemical	114	120	140	169	160	30.7%	30.8%	30.7%	32.5%	33.8%
Civil & Environmental	154	168	203	225	237	24.0%	29.2%	23.2%	20.0%	23.3%
Electrical & Computer	344	382	467	482	540	16.6%	15.4%	15.4%	15.4%	16.1%
Management Sciences	167	169	159	192	219	26.3%	31.4%	30.2%	34.9%	31.1%
Mechanical & Mechatronics	183	187	214	248	291	13.1%	13.4%	13.6%	11.7%	15.1%
Systems Design	88	92	95	94	105	23.9%	29.3%	25.3%	21.3%	21.9%
TOTAL	1115	1224	1430	1607	1817	22.9%	24.3%	23.4%	23.8%	24.3%

(B) by department, with % visa

Department	Total Enrolment					% Visa				
	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
Architecture	65	73	106	131	147	3.1%	4.1%	4.7%	6.1%	4.8%
BET	n/a	33	46	66	118	n/a	15.2%	41.3%	51.5%	61.9%
Chemical	114	120	140	169	160	45.6%	46.7%	40.7%	40.8%	42.5%
Civil & Environmental	154	168	203	225	237	26.0%	26.2%	22.7%	25.3%	27.8%
Electrical & Computer	344	382	467	482	540	38.7%	36.1%	32.5%	35.7%	36.5%
Management Sciences	167	169	159	192	219	15.0%	17.8%	20.1%	20.3%	22.4%
Mechanical & Mechatronics	183	187	214	248	291	18.0%	19.8%	16.8%	18.1%	21.3%
Systems Design	88	92	95	94	105	30.7%	20.7%	25.3%	25.5%	32.4%
TOTAL	1115	1224	1430	1607	1817	28.0%	27.1%	25.9%	27.9%	30.6%

Five-year Comparison of Graduate Enrolment

November 1 count date, including full- and part-time students

(C) by department and degree type (including non-degree[1])

Department	PhD					Research Master				
	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
Architecture	0	0	0	0	0	61	70	101	124	144
BET	n/a	0	0	0	0	n/a	0	0	0	0
Chemical	67	77	76	81	84	39	39	57	75	59
Civil & Environmental	61	67	73	75	89	59	66	82	81	85
Electrical & Computer	201	214	249	242	264	119	126	124	140	132
Management Sciences	26	30	34	35	31	28	22	21	31	33
Mechanical & Mechatronics	63	80	88	92	105	74	75	78	109	115
Systems Design	42	42	42	55	56	38	42	43	34	33
TOTAL	460	510	562	580	629	418	440	506	594	601

Department	Professional Master					Non-Degree[1]				
	2005[2]	2006	2007	2008	2009	2005	2006	2007	2008	2009
Architecture	0	0	0	0	0	4	3	5	7	3
BET	n/a	33	46	47	62	n/a	0	0	19	56
Chemical	7	4	7	13	17	1	0	0	0	0
Civil & Environmental	34	35	48	65	60	0	0	0	4	3
Electrical & Computer	24	41	92	99	140	0	1	2	1	4
Management Sciences	112	116	103	124	153	1	1	1	2	2
Mechanical & Mechatronics	45	28	44	46	69	1	4	4	1	2
Systems Design	1	1	4	2	11	7	7	6	3	5
TOTAL	223	258	344	396	512	14	16	18	37	75

NOTES:

1. Non-degree includes diploma and certificate programs.
2. Professional Master counts include 2005 cost-recovery students.

Five-year Comparison of Fall FTE Graduate Enrolment

Fall Term (November 1 count date) FTE enrolment

(A) by department and visa status, excluding non-degree[1] programs

	CDN/PR					International					Total				
Department	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
Architecture	74.9	71.8	93.7	111.8	122.5	1.7	1.0	1	1	4	76.6	72.8	94.7	112.8	126.5
BET	n/a	28.0	27	29.2	38	n/a	5.0	19	15	17	n/a	33.0	46	44.2	55
Chemical	56.4	55.6	72.5	88.8	84.3	51.0	56.0	57	69	68	107.4	111.6	129.5	157.8	152.3
Civil & Environmental	102.1	107.2	138.8	142.6	146.9	39.3	44.0	46	56	64	141.4	151.2	184.8	198.6	210.9
Electrical & Computer	167.3	190.1	242.6	232	246.4	132.3	135.6	149.6	167.8	188.4	299.6	325.7	392.2	399.8	434.5
Management Sciences	76.9	69.7	66.8	87.9	99.3	21.9	26.9	28.9	33.5	44.9	98.8	96.6	95.7	121.4	144.2
Mechanical &Mechatronics	123.7	126.7	142.8	167.7	188.1	32.3	36.0	34.3	44.3	59.3	156.0	162.7	177.1	212	247.7
Systems Design	52.3	65.3	66.1	65.8	66.8	20.3	12.0	18	21	29	72.6	77.3	84.1	86.8	95.8
TOTAL	**653.6**	**714.4**	**850.3**	**925.8**	**992.3**	**298.8**	**316.5**	**353.8**	**407.6**	**474.6**	**952.4**	**1030.9**	**1204.1**	**1333.4**	**1466.9**

NOTES:
1. Non-degree includes diploma and certificate programs.
2. FTE enrolment = FT + (PT*0.3)

Five-year Comparison of Fall FTE Graduate Enrolment

Fall Term (November 1 count date) FTE enrolment

(B) by department and degree type (including non-degree[1] programs)

Department	PhD					Research Master				
	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
Architecture	0.0	0.0	0.0	0.0	0	76.6	72.8	94.7	112.8	126.5
BET	n/a	0.0	0.0	0.0	0	n/a	0.0	0.0	0.0	0
Chemical	64.2	73.5	73.2	76.8	80.5	36.9	36.2	50.7	68.7	56.9
Civil & Environmental	55.4	62.1	69.5	70.1	82.7	55.5	62.5	77.8	75.4	79.4
Electrical & Computer	190.2	203.5	235.7	228.7	247.2	102.2	112.5	103.7	120.4	112.4
Management Sciences	21.8	23.7	27.7	28.7	26.1	23.1	18.8	18.2	27.5	29.5
Mechanical & Mechatronics	58.1	76.5	79.6	85.0	96.6	68.4	70.8	72.4	103.4	106.6
Systems Design	38.5	37.8	41.3	54.3	55.3	33.8	37.8	39.5	30.5	31.6
TOTAL	428.2	477.1	527.0	543.6	588.4	396.5	412.1	457.0	538.7	542.9

Department	Professional Master[2]					Non-Degree[1]				
	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
Architecture	0.0	0.0	0.0	0.0	0	4	3	2.9	7	3
BET	n/a	33.0	46.0	44.2	55	n/a	0	0	19	56
Chemical	6.3	1.9	5.6	12.3	14.9	1	0	0	0	0
Civil & Environmental	30.5	26.6	37.5	53.1	48.8	0	0	0	1.9	2.3
Electrical & Computer	7.2	9.7	52.8	50.7	74.9	0	0.3	1.3	0.3	2.6
Management Sciences	53.9	54.1	49.8	65.2	88.6	0.3	3.3	1.9	1	2
Mechanical & Mechatronics	29.5	15.4	25.1	23.6	44.5	1	1	1	2	2
Systems Design	0.3	1.0	3.3	2.0	8.9	6.3	7.0	6	3	5
TOTAL	127.7	141.7	220.1	251.1	335.6	12.6	14.6	13.1	34.2	72.9

NOTES:
1. Non-degree includes diploma and certificate programs.
2. Professional Master counts include 2005 cost-recovery students.
3. FTE enrolment = FT + (PT*0.3)

Five-year Comparison of Graduate Degrees Granted

Degrees granted at spring and fall convocation | MArch, MASc, MBET, MMSc, MEng and PhD degrees

(A) by department, with % women

	Total Gradudate Degrees					% Women				
Department	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
Architecture	30	27	21	20	32	56.7%	51.9%	57.1%	50%	71.9%
BET	n/a	31	33	47	42	n/a	51.6%	36.4%	38.3%	57.1%
Chemical	36	27	34	28	41	30.6%	40.7%	26.5%	39.3%	31.7%
Civil & Environmental	38	46	54	47	67	18.4%	19.6%	31.5%	25.5%	11.9%
Electrical & Computer	61	81	88	125	121	11.7%	13.6%	23.9%	17.6%	15.3%
Management Sciences	37	68	64	46	65	27.0%	25.0%	35.9%	34.8%	30.8%
Mechanical & Mechatronics	58	68	58	54	60	20.7%	13.2%	13.8%	14.8%	16.7%
Systems Design	31	24	24	26	20	29.0%	20.8%	41.7%	30.8%	30.0%
TOTAL	291	372	376	393	448	25.2%	24.7%	29.8%	26.7%	27.5%

(B) by degree

Degree	2005	2006	2007	2008	2009
MArch	30	27	21	20	32
MASc	147	145	153	126	151
MBET	n/a	31	33	47	42
MMSc	15	41	45	36	45
MEng	43	66	37	66	82
PhD	56	62	87	98	96
TOTAL	291	372	376	393	448

Five-year Comparison of Graduate Students:Faculty Ratio

Fall Term (November 1 count date) FTE enrolment to tenured & tenure-stream faculty

Department	Degree Type	2005	2006	2007	2008	2009
Architecture	All research students	5.5	4.9	5.6	7.1	8.4
	All students	5.5	4.9	5.7	7.1	8.6
BET	All research students	n/a	0.0	0.0	0.0	0.0
	All students	n/a	33.0	92.0	29.5	111.0
Chemical Engineering	All research students	4.0	4.2	4.3	4.7	4.4
	All students	4.3	4.3	4.5	5.1	4.9
Civil & Environmental Engineering	All research students	3.7	4.0	4.7	4.8	4.9
	All students	4.7	4.9	5.9	6.6	6.4
Electrical & Computer Engineering	All research students	4.9	5.1	4.8	4.9	4.9
	All students	5.0	5.2	5.5	5.6	6.0
Management Sciences	All research students	3.0	2.5	2.7	3.3	2.9
	All students	6.6	5.7	5.6	7.0	7.6
Mechanical & Mechatronics Engineering	All research students	3.3	3.5	3.5	3.9	4.1
	All students	4.1	3.9	4.1	4.4	5.0
Systems Design Engineering	All research students	4.2	4.2	3.8	4.0	3.7
	All students	4.6	4.2	4.2	4.1	4.3
TOTAL	All research students	4.1	4.2	4.3	4.6	4.6
	All students	4.8	4.8	5.3	5.6	6.3

D. RESEARCH DATA

Sponsored Research Funds, 2008/09

Fiscal year 2008/2009, by department and type

Department	Grants	Contracts	Total
Architecture	$326,450	$114,875	$441,325
Chemical	$3,758,181	$1,439,282	$5,197,463
Civil & Environmental	$4,271,732	$2,006,543	$6,278,275
Electrical & Computer	$15,891,996	$3,636,239	$19,528,235
Management Sciences	$765,478	$97,734	$863,212
Mechanical & Mechatronics	$5,686,501	$3,666,082	$9,352,583
Systems Design	$1,560,183	$260,220	$1,820,403
Other [1]	$3,845,114	$19,100	$3,864,214
TOTAL	$36,105,635	$ 11,240,075	$47,345,710

NOTE:

1. Includes $3.6 million in joint science/engineering funding to equip the Quantum Nano Centre.

Sponsored Research Funds, 2009/10

Fiscal year 2009/2010, by department and type

Department	Grants	Contracts	Total
Architecture	$443,914	$0	$443,914
Chemical	$4,388,341	$2,115,965	$6,504,305
Civil & Environmental	$3,964,843	$2,695,874	$6,660,717
Electrical & Computer	$12,525,629	$5,411,971	$17,937,599
Management Sciences	$760,962	$50,000	$810,962
Mechanical & Mechatronics	$5,806,192	$4,750,999	$10,557,190
Systems Design	$3,223,402	$1,065,418	$4,288,819
Other [1]	$3,815,654	$0	$3,815,654
TOTAL	$34,928,936	$16,090,226	$ 51,019,162

NOTE:

1. Includes $3.6 million in joint science/engineering funding to equip the Quantum Nano Centre.

Contracts Awarded, 2008/09

Fiscal year 2008/2009, by department and sector

Department	Federal	Provincial	Industry	Other	Total
Architecture	$0	$0	$0	$114,875	$114,875
Chemical	$41,000	$431,223	$633,059	$334,000	$1,439,282
Civil & Environmental	$38,714	$1,104,069	$178,428	$685,332	$2,006,543
Electrical & Computer	$112,400	$2,703,984	$573,739	$246,115	$3,636,238
Management Sciences	$0	$0	$0	$97,734	$97,734
Mechanical & Mechatronics	$80,493	$2,742,297	$691,356	$151,937	$3,666,083
Systems Design	$22,000	$198,970	$33,850	$5,400	$260,220
Other	$0	$0	$19,100	$0	$19,100
TOTAL	$294,607	$7,180,543	$2,129,532	$1,635,393	$11,240,075

Grants Awarded, 2008/09

Fiscal year 2008/2009, by department and sector

Department	Federal	Provincial	Industry	Other	Total
Architecture	$183,950	$0	$135,000	$7,500	$326,450
Chemical	$2,730,259	$197,961	$328,129	$421,832	$3,678,181
Civil & Environmental	$2,520,509	$585,719	$342,500	$746,505	$4,195,233
Electrical & Computer	$9,430,536	$2,962,276	$2,089,730	$1,139,954	$15,622,496
Management Sciences	$698,416	$0	$0	$67,062	$765,478
Mechanical & Mechatronics	$3,893,340	$489,892	$452,630	$656,982	$5,492,844
Systems Design	$1,395,793	$28,000	$0	$59,390	$1,483,183
Other [1]	$2,109,370	$2,244,462	$0	$187,938	$4,541,770
TOTAL	$22,962,173	$6,508,310	$3,347,989	3,287,163	$36,105,635

NOTE:

1. Includes $3.6 million in joint science/engineering funding to equip the Quantum Nano Centre.

Contracts Awarded, 2009/10

Fiscal year 2009/20010, by department and sector

Department	Federal	Provincial	Industry	Other	Total
Architecture	$0	$0	$0	$0	$0
Chemical	$42,000	$111,341	$1,603,124	$359,500	$2,115,965
Civil & Environmental	$120,000	$1,070,610	$727,268	$777,996	$2,695,874
Electrical & Computer	$0	$4,507,352	$305,739	$598,880	$5,411,971
Management Sciences	$0	$50,000	$0	$0	$50,000
Mechanical & Mechatronics	$178,036	$3,913,240	$571,824	$87,900	$4,750,999
Systems Design	$34,300	$328,207	$702,910	$0	$1,065,418
Other	$0	$0	$0	$0	$0
TOTAL	$374,336	$9,980,750	$3,910,863	$1,824,276	$16,090,226

Grants Awarded, 2009/10

Fiscal year 2009/20010, by department and sector

Department	Federal	Provincial	Industry	Other	Total
Architecture	$125,410		$280,000	$38,504	$443,914
Chemical	$3,349,470	$193,324	$274,086	$571,461	$4,388,341
Civil & Environmental	$2,518,803	$426,020	$299,250	$720,770	$3,964,843
Electrical & Computer	$8,323,408	$1,610,815	$1,685,874	$905,531	$12,525,629
Management Sciences	$677,221		$40,000	$43,741	$760,962
Mechanical & Mechatronics	$4,035,878	$487,953	$447,199	$835,161	$5,806,192
Systems Design	$2,600,915	$28,000	$418,750	$175,737	$3,223,402
Other [1]	$1,413,730	$2,244,462		$157,462	$3,815,654
TOTAL	$23,044,835	$4,990,574	$3,445,160	$3,448,367	$34,928,936

NOTE:

1. Includes $3.6 million in joint science/engineering funding to equip the Quantum Nano Centre.

Tri-Council Grants Awarded, 2008/09

Fiscal year 2008/2009, by funding agency

Department	CIHR	SSHRC	NSERC	Total
Architecture	$0	$118,950	$0	$118,950
Chemical	$58,550	$0	$2,075,834	$2,134,384
Civil & Environmental	$57,717	$0	$1,824,300	$1,882,017
Electrical & Computer	$70,360	$0	$6,451,897	$6,522,257
Management Sciences	$0	$317,200	$203,746	$520,946
Mechanical & Mechatronics	$0	$0	$2,477,671	$2,477,671
Systems Design	$0	$0	$1,386,203	$1,386,203
Other[1]	$0	$0	$18,000	$18,000
TOTAL	$186,627	$436,150	$14,437,651	$15,060,428

Tri-Council Grants Awarded, 2009/10

Fiscal year 2009/2010, by funding agency

Department	CIHR	SSHRC	NSERC	Total
Architecture	$0	$105,410	$0	$105,410
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
Other[1]	$0	$0	$19,016	$19,016
TOTAL	$186,627	$404,008	$14,949,451	$15,540,086

NSERC Grants Awarded, 2008/09

Fiscal year 2008/2009, by department and type

Department	Discovery	RTI	Strategic	Industry[2]	Other	Total
Architecture	$0	$0	$0	$0	$0	$0
Chemical	$956,407	$255,601	$451,618	$332,208	$80,000	$2,075,834
Civil & Environmental	$879,520	$0	$0	$833,280	$111,500	$1,824,300
Electrical & Computer	$2,058,133	$276,237	$2,077,188	$1,756,705	$283,634	$6,451,897
Management Sciences	$203,746	$0	$0	$0	$0	$203,746
Mechanical & Mechatronics	$1,123,220	$217,607	$298,745	$643,562	$194,537	$2,477,671
Systems Design	$580,771	$292,650	$278,846	$108,736	$125,200	$1,386,203
Other[1]	$0	$0	$0	$0	$18,000	$18,000
TOTAL	$5,801,797	$1,042,095	$3,106,397	$3,674,491	$812,871	$14,437,651

NOTES:

1. Other includes Promoscience Grant for ESQ.
2. Industry includes CRD, IRC/CDE, CHRP, SRO and I2I.

NSERC Grants Awarded, 2009/10

Fiscal year 2009/2010, by department and type

Department	Discovery	RTI	Strategic	Industry[2]	Other	Total
Architecture	$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
Other[1]	$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

NOTES:

1. Other includes Promoscience Grant for ESQ.
2. Industry includes CRD, IRC/CDE, I2I and CHRP.

Sponsored Research Funds:Faculty Ratio, 2008/09

Research funds, fiscal year 2008/2009 to tenured and tenure-stream faculty as of November 1, 2008

Department	Total Research Funding	Tenured & Tenure-Stream Faculty	Research Funding per Faculty
Architecture	$441,325	15.0	$29,422
BET	n/a	1.0	n/a
Chemical	$5,197,463	31.0	$167,660
Civil & Environmental	$6,278,275	33.3	$188,820
Electrical & Computer	$19,528,235	71.0	$275,046
Management Sciences	$863,212	19.3	$44,842
Mechanical & Mechatronics	$9,352,583	50.0	$187,052
Systems Design	$1,820,403	22.3	$81,632
Other Faculty Offices[1,2]	$3,864,214	n/a	n/a
TOTAL	$47,345,710	242.8	$194,999
Excluding Architecture & CBET	$46,904,385	226.8	$206,809

Sponsored Research Funds:Budget Ratio, 2008/09

Department	Total Research Funding	Total Budget	Research Funding to Budget
Faculty of Engineering as a whole	$47,345,710	$64,182,909	0.74
Excluding Architecture & CBET	$46,904,385	$60,286,216	0.78

NOTE:
1. Includes $3.6 million in joint science/engineering funding to equip the Quantum Nano Centre.
2. Includes all areas outside of academic departments. (e.g. Dean's Office, Undergraduate Office, Engineering Computing, Machine Shop, etc.)

Sponsored Research Funds:Faculty Ratio, 2009/10

Research funds, fiscal year 2009/2010 to tenured and tenure-stream faculty as of May 1, 2010

Department	Total Research Funding	Tenured & Tenure-Stream Faculty	Research Funding per Faculty
Architecture	$443,914	15.0	$29,594
BET	n/a	1.0	n/a
Chemical	$6,504,305	31.0	$209,816
Civil & Environmental	$6,660,717	33.3	$200,322
Electrical & Computer	$17,937,599	73.0	$245,721
Management Sciences	$810,962	19.3	$42,128
Mechanical & Mechatronics	$10,557,190	50.0	$211,144
Systems Design	$4,288,819	23.3	$184,069
Other Faculty Offices[1,2]	$3,815,654	n/a	n/a
TOTAL	$51,019,160	245.8	$207,564
Excluding Architecture & CBET	$50,575,246	229.8	$220,084

Sponsored Research Funds:Budget Ratio, 2009/10

Department	Total Research Funding	Total Budget	Research Funding to Budget
Faculty of Engineering as a whole	$51,019,162	$71,989,280	0.71
Excluding Architecture & CBET	$50,575,248	$67,474,157	0.75

NOTE:
1. Includes $3.6 million in joint science/engineering funding to equip the Quantum Nano Centre.
2. Includes all areas outside of academic departments. (e.g. Dean's Office, Undergraduate Office, Engineering Computing, Machine Shop, etc.)

Six-year Comparison of Sponsored Research Funds

Fiscal year, in thousands of dollars

	Total					
Department	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Architecture	$235	$117	$61	$81	$441	$444
Chemical	$4,540	$4,959	$5,160	$6,061	$5,198	$6,504
Civil & Environmental	$5,179	$5,883	$6,140	$6,385	$6,278	$6,661
Electrical & Computer	$9,849	$11,895	$20,485	$15,382	$19,528	$17,938
Management Sciences	$280	$576	$518	$715	$863	$811
Mechanical & Mechatronics	$5,894	$6,734	$9,409	$8,398	$9,353	$10,557
Systems Design	$2,003	$2,014	$1,622	$2,529	$1,821	$4,289
Other		$151	$658	$3,722	$3,864	$3,816
TOTAL	$27,980	$32,329	$44,052	$43,273	$47,346	$51,019

Six-year Comparison of Tri-Council Grants Awarded

Fiscal year	CIHR	SSHRC	NSERC	TOTAL
2004/05	$342	$109	$10,456	$10,907
2005/06	$391	$255	$11,611	$12,257
2006/07	$223	$125	$14,598	$14,946
2007/08	$214	$347	$14,459	$15,020
2008/09	$187	$436	$14,438	$15,061
2009/10	$187	$404	$14,949	$15,540

Six-year Comparison of NSERC Grants Awarded

Fiscal year, in thousands of dollars

(A) total, by department

	Total					
Department	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Chemical	$2,751	$2,370	$2,742	$2,745	$2,076	$2,560
Civil & Environmental	$1,570	$1,643	$1,851	$2,328	$1,824	$1,874
Electrical & Computer	$3,757	$4,692	$5,188	$5,381	$6,452	$5,972
Management Sciences	$162	$217	$229	$215	$204	$254
Mechanical & Mechatronics	$1,419	$1,888	$3,374	$2,465	$2,478	$2,467
Systems Design	$797	$801	$758	$1,325	$1,386	$1,803
Other [1]	$0	$0	$456	$0	$18	$19
TOTAL	$10,456	$11,611	$14,598	$14,459	$14,438	$14,949

NOTE:

1. In 2008/09 and 2009/10, other includes Promoscience: Engineering Science Quest Satellite Program.

Six-year Comparison of NSERC Grants Awarded

Fiscal year, in thousands of dollars

(B) by department and type (excluding 'other')

Discovery						
Department	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Chemical	$1,134	$1,076	$1,060	$626	$956	$1,153
Civil & Environmental	$911	$899	$805	$748	$880	$868
Electrical & Computer	$1,840	$2,000	$2,028	$2,071	$2,058	$2,366
Management Sciences	$162	$195	$195	$221	$204	$254
Mechanical & Mechatronics	$1,077	$1,220	$1,103	$1,143	$1,123	$1,186
Systems Design	$464	$475	$429	$484	$581	$646
TOTAL	$5,588	$5,865	$5,620	$5,293	$5,802	$6,473
RTI						
Department	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Chemical	$585	$138	$700	$536	$256	$447
Civil & Environmental	$189	$128	$269	$71	$0	$150
Electrical & Computer	$238	$500	$434	$83	$276	$360
Management Sciences	$0	$22	$35	$0	$0	$0
Mechanical & Mechatronics	$60	$200	$1,142	$142	$218	$299
Systems Design	$69	$0	$122	$166	$293	$336
TOTAL	$1,141	$988	$2,702	$998	$1,043	$1,592
Strategic						
Department	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Chemical	$362	$350	$646	$819	$452	$188
Civil & Environmental	$0	$136	$148	$150	$0	$0
Electrical & Computer	$671	$560	$699	$1,521	$208	$1,695
Management Sciences	$0	$0	$0	$0	$0	$0
Mechanical & Mechatronics	$0	$0	$104	$386	$299	$98
Systems Design	$238	$259	$144	$286	$279	$127
TOTAL	$1,271	$1,305	$1,741	$3,162	$1,238	$2,108
Industry						
Department	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Chemical	$670	$806	$337	$353	$782	$636
Civil & Environmental	$205	$480	$629	$1,271	$383	$721
Electrical & Computer	$1,008	$1,385	$2,026	$1,143	$1,757	$1,353
Management Sciences	$0	$0	$0	$0	$0	$0
Mechanical & Mechatronics	$282	$468	$1,025	$653	$644	$712
Systems Design	$0	$0	$63	$250	$109	$490
TOTAL	$2,165	$3,139	$4,080	$3,670	$3,675	$ 3,912

Six-year Comparison of Sponsored Research Funds:Faculty Ratio

Fiscal year research dollars to tenured and tenure-stream faculty as of October 1[1] count date

	Research Funding per Faculty Member					
Department	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Architecture	$16,207	$7,548	$3,613	$5,031	$29,422	$29,594
Chemical	$174,615	$190,731	$177,939	$195,532	$167,660	$209,816
Civil & Environmental	$172,633	$183,844	$196,470	$211,063	$188,820	$200,322
Electrical & Computer	$164,150	$183,000	$288,520	$216,648	$275,046	$245,721
Management Sciences	$18,667	$36,000	$30,009	$41,466	$44,842	$42,128
Mechanical & Mechatronics	$147,350	$156,605	$218,809	$174,955	$187,052	$211,144
Systems Design	$105,421	$100,700	$76,142	$118,724	$81,632	$184,069
TOTAL	$136,156	$148,298	$191,699	$184,296	$194,999	$207,564
Excluding Architecture & CBET	$145,261	$159,465	$206,725	$197,405	$206,809	$220,084

NOTE:
1. Faculty count for 2009/10 is as of May 1, 2010.

Six-year Comparison of Sponsored Research Funds:Budget Ratio

Fiscal year, by department

	Research Funding to Budget					
Department	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Faculty of Engineering as a whole	0.59	0.63	0.75	0.73	0.74	0.71
Excluding Architecture and CBET	0.62	0.66	0.79	0.76	0.78	0.75

E. ADVANCEMENT DATA

Alumni with Valid Addresses (Mailing and/or E-mail)

Total and valid alumni as of December 31, 2009

Department	Total Alumni	Valid Alumni[1]	% Valid
Architecture	1,817	1,600	88.1%
BET	198	197	99.5%
Chemical Engineering	3,883	3,448	88.8%
Civil & Environmental Engineering	6,049	5,417	89.6%
Electrical & Computer Engineering	8,659	7,885	91.1%
Management Sciences	1,308	1,094	83.6%
Mechanical & Mechatronics Engineering	6,939	6,301	90.8%
Systems Design Engineering	2,901	2,682	92.5%
TOTAL	31,754	28,624	90.1%

NOTE:
1. Valid alumni are those for whom the UW Office of Alumni Affairs has at least one current method of contact.

Engineering Alumni Donating to University of Waterloo, 2009

Valid alumni and alumni who donated between January 1, 2009 - December 31, 2009

Department	Valid Alumni	Alumni Who Donated	% Donating
Architecture	1,600	103	6.4%
BET	197	11	5.6%
Chemical Engineering	3,448	240	7.0%
Civil & Environmental Engineering	5,417	357	6.6%
Electrical & Computer Engineering	7,885	464	5.9%
Management Sciences	1,094	55	5.0%
Mechanical & Mechatronics Engineering	6,301	406	6.4%
Systems Design Engineering	2,682	164	6.1%
TOTAL	28,624	1800	6.3%

Engineering Alumni Donating to University of Waterloo, lifetime

Valid alumni and alumni who have donated as of December 31, 2009 (at least once)

Department	Valid Alumni	Alumni Who Donated	% Donating
Architecture	1,600	573	35.8%
BET	197	22	11.2%
Chemical Engineering	3,448	1,804	52.3%
Civil & Environmental Engineering	5,417	2,754	50.8%
Electrical & Computer Engineering	7,885	3,463	43.9%
Management Sciences	1,094	440	40.2%
Mechanical & Mechatronics Engineering	6,301	3,254	51.6%
Systems Design Engineering	2,682	1,324	49.4%
TOTAL	28,624	13,634	47.6%

Donations to the Faculty of Engineering, 2008/09

Department/Defined Area	Alumni Donations	Total Donations
Architecture	$5,795.97	$64,343.89
BET	$61,580.00	$249,703.12
Chemical Engineering[1]	$24,628.67	$34,911.24
Civil & Environmental Engineering [2]	$16,672.27	$93,770.78
Electrical & Computer Engineering [3]	$15,787.43	$99,180.35
Management Sciences	$839.80	$844.80
Mechanical & Mechatronics Engineering	$24,584.44	$27,894.44
Systems Design Engineering	$12,054.59	$14,047.16
Student Teams	$5,564.58	$42,299.49
Undergraduate Scholarships	$65,657.01	$480,898.15
Graduate Scholarships	$157,879.18	$214,218.07
Chairs & Faculty Awards	$250.00	$35,250.00
Equipment & Infrastructure	$161,146.95	$3,541,652.66
Faculty of Engineering	$102,731.93	$237,283.85
TOTAL	$655,172.82	$5,136,298.00

NOTES:
1. Includes funds received for Nanotechnology Engineering.
2. Includes funds received for Geological Engineering.
3. Includes funds received for Software Engineering.

Donations to the Faculty of Engineering, 2009/10

Department/Defined Area	Alumni Donations	Total Donations
Architecture	$19,403.92	$179,324.99
BET	$90,000.94	$358,155.10
Chemical Engineering[1]	$26,230.90	$38,088.68
Civil & Environmental Engineering [2]	$24,935.76	$28,020.76
Electrical & Computer Engineering [3]	$23,948.51	$32,497.87
Management Sciences	$1,243.29	$1,243.29
Mechanical & Mechatronics Engineering	$33,674.52	$44,976.01
Systems Design Engineering	$15,266.99	$16,859.19
Student Teams	$2,200.90	$90,591.38
Undergraduate Scholarships	$114,388.57	$307,381.66
Graduate Scholarships	$47,312.45	$254,141.90
Chairs & Faculty Awards	$0.00	$635,000.00
Equipment & Infrastructure	$395,416.80	$620,167.39
Faculty of Engineering	$99,176.05	$249,106.50
TOTAL	$893,199.60	$2,855,554.72

NOTES:

1. Includes funds received for Nanotechnology Engineering.
2. Includes funds received for Geological Engineering.
3. Includes funds received for Software Engineering.

Engineering Endowments, 2008/09

Total principal in engineering endowment funds at 2008/09 fiscal year end

Endowment	Principal
Eng Scholarship Fund	$2,507,298
Eyton Chair	$2,489,899
Heasley, Col H	$1,977,663
Carl A Pollock Schp Fund	$559,181
Waterloo Engineering Endowment Fund (WEEF)	$8,427,858
Equipment Fund	$1,430,428
Nortel Networks	$937,414
Chandrashekar Memorial	$256,689
Iron Ring Fund	$126,525
Madter Fund	$1,223,389
O'Donovan Chair	$2,779,507
Ontario Graduate Fellowships	$200,000
School of Architecture--Cambridge	$6,079,370
Sustainable Energy Management Chair	$3,042,000
Nanotechnology Chairs	$9,000,000
EH Yang Engineering Research Innovation Award	$200,000
The Best Young Minds Grad Scholarships	$22,620
Endowments held in UW Grad Office	$14,364,494
Endowments held in UW Student Awards Office	$9,520,990
TOTAL	$65,145,325

Engineering Endowments, 2009/10

Total principal in engineering endowment funds at 2009/10 fiscal year end

Endowment	Principal
Eng Scholarship Fund	$2,509,201
Eyton Chair	$2,520,054
Heasley, Col H	$2,001,614
Carl A Pollock Schp Fund	$565,953
Waterloo Engineering Endowment Fund (WEEF)	$9,073,236
Equipment Fund	$1,461,286
Nortel Networks	$948,767
Chandrashekar Memorial	$259,797
Iron Ring Fund	$139,222
Hydro One	$300,000
Madter Fund	$1,238,205
O'Donovan Chair	$2,813,169
Ontario Graduate Fellowships	$202,422
School of Architecture--Cambridge	$6,205,520
Sustainable Energy Management Chair	$3,078,841
Nanotechnology Chairs	$9,000,000
EH Yang Engineering Research Innovation Award	$202,422
The Best Young Minds Grad Scholarships	$27,093
Norman W McLeod Chair in Sustainable Pavement Eng	$335,000
Endowments held in UW Grad Office	$14,780,071
Endowments held in UW Student Awards Office	$12,806,007
TOTAL	$70,467,880

Alumni Attending Selected Class Reunions, 2009

Percent of those invited who registered for reunion1 in 2009, by department and class

	Reunion Year								
Department	5	10	15	20	25	30	35	40	45
Chemical Engineering	1.5%	4.8%	0.0%	16.2%	5.7%	48.0%	2.0%	26.9%	0.0%
Civil & Environmental Engineering	4.1%	2.9%	6.8%	13.7%	8.8%	16.0%	2.9%	13.8%	16.7%
Electrical & Computer Engineering	1.3%	7.5%	3.5%	3.0%	9.5%	1.1%	7.3%	23.0%	0.0%
Mechanical & Mechatronics Engineering	4.7%	1.1%	2.4%	7.0%	0.0%	10.9%	5.4%	15.9%	11.1%
Systems Design Engineering	0.0%	8.8%	1.5%	17.5%	8.7%	28.3%	12.0%	0.0%	0.0%
OVERALL PARTICIPATION	2.4%	5.1%	3.3%	10.0%	5.7%	18.1%	5.2%	19.2%	8.7%

NOTE:
1. Including only those departments with undergraduate programs in the given reunion year.

Alumni Events, 2009

Events hosted by Waterloo Engineering Alumni Affairs, January - December, 2009

Event	City	Date
Waterloo Engineering Alumni & Friends Reception at TRB	Washington, DC	13-Jan-09
Waterloo Engineering Alumni Ski Day	Collingwood, ON	16-Jan-09
Waterloo Engineering Alumni & Friends Reception at the IEEE 2008 International Solid-State Circuits Conference (ISSCC)	San Francisco, CA	10-Feb-09
Waterloo Engineering Alumni & Friends Reception at Facebook	Palo Alto, CA	11-Feb-09
Waterloo Engineering Alumni & Friends Reception at the SAE 2008 World Congress	Windsor, ON	22-Apr-09
Waterloo Architecture Alumni Reception at the Ontario Association of Architects Conference	Toronto, ON	07-May-09
Engineering Class of 2009 Post Convocation Receptions (2 receptions total)	Waterloo, ON	13-Jun-09
Reunion Class Rep Reception	Waterloo, ON	24-Sep-09
Reunions (1989, 1994, 1994, 2004)	Waterloo, ON	26-Sep-09
Reunions (1963, 1968, 1673, 1978, and 1983)	Waterloo, ON	26/27-Sept-09
Waterloo Engineering Alumni Luncheon at Imperial Oil	Calgary, AB	21-Oct-09
Waterloo Engineering Alumni Networking Reception at the Calgary Petroleum Club	Calgary, AB	21-Oct-09
Engineering Class of 2009 Post Convocation Receptions	Waterloo, ON	24-Oct-09
Alumni Reception in Hong Kong	Hong Kong	06-Nov-10
A Poetry Recital for Waterloo Engineering Alumni with Barney Lawrence	Waterloo, ON	19-Nov-09

Dean's Advisory Council Members

Tyseer Aboulnasr	Dean of Applied Science, University of British Columbia, Vancouver, British Columbia
Rahul Bhatia	Managing Director, InterGlobe Enterprises Limited, Haryana, India
Doug Beynon	President, Beynon Enterprises, Waterloo, Ontario
Catherine Booth	Corporate Director and Board Member
Thomas Brzustowski	Professor for the Commercialization of Innovations, University of Ottawa; Former President, NSERC
Savvas Chamberlain	CTO & Chairman, DALSA Corporation, Waterloo, Ontario
Arthur Church	President & Chief Executive Officer, Mancor Industries, Oakville, Ontario
Rod Coutts	Chairman, Navcast Incorporated, Mississauga, Ontario
Anthony Franceschini	President & Chief Executive Officer, Stantec Incorporated, Edmonton, Alberta
Murray Gamble	President, the C3Group, Breslau, Ontario
Frederick R. Grigsby (Chair)	Former Senior Vice-President and CIO (retired), Canadian National Railway, Montreal, Quebec
Adrian Hartog	Former Senior VP & GM, Consumer Electronics Group, Advanced Micro Devices (AMD) Inc., Markham, Ontario
Tom Jenkins	Executive Chairman and Chief Strategy Officer, Open Text Corporation, Waterloo, Ontario
Jacques Lamarre	President & Chief Executive Officer, SNC-Lavalin Group Incorporated, Montreal, Quebec
Patrick Lamarre	President, SNC-Lavalin Nuclear Incorporated, Oakville, Ontario
Norman Lockington	Vice-President, Technology (retired), Dofasco, Burlington, Ontario
Robert Magee	President & Chief Executive Officer, Woodbridge Foam Corporation, Mississauga, Ontario
Kevin Murai	Chief Executive Officer and Member of the Board of Directors, Synnex Corporation, Freemont, California
Mike Pascoe	CEO, Magor Communications, Ottawa, Ontario
Paul Spafford	Vice Chairman and Managing Director, CIBC World Markets Incorporated, Toronto, Ontario
Andrew Stephens	VP Corporate Planning and Communications, Petro Canada Products Division
Ray Tanguay	President, Toyota Motor Manufacturing Canada Incorporated, Cambridge, Ontario
Glenn Turchan	Executive Vice President, Conestoga-Rovers & Associates, Waterloo, Ontario
Don Walker	Co-Chief Executive Officer, Magna International Incorporated, Aurora, Ontario
Douglas Wright	Former President, UW and Founding Dean, UW Faculty of Engineering, Toronto, Ontario
Morden Yolles	Partner, Halcrow Yolles, Toronto, ON

Campaign Cabinet Members

Bill Tatham	Chairman and CEO, NexJ Systems Incorporated, North York, Ontario
David Bertran	Westport Island, Maine
Douglas Beynon	President, Beynon Enterprises, Waterloo, Ontario
Erin Chapple	Group Program Manager, Microsoft Corporation, Redmond, Washington
Frederick R. Grigsby (Chair)	Former Senior Vice-President and CIO (retired), Canadian National Railway, Montreal, Quebec
Jason Chiu	Founder & CEO, The Cherrypicks Group, Hong Kong
Joe Pok	Director, Planning and Development, Suncor Energy Incorporated, Calgary, Alberta
Mike Pascoe	CEO, Magor Communications, Ottawa, Ontario
Murray Gamble	President & CEO, The C3 Group, Breslau, Ontario
Norman Lockington	Vice-President, Technology (retired), Dofasco, Burlington, Ontario
Paul Spafford	Vice-Chairman & Managing Director, CIBC World Markets Incorporated, Toronto, Ontario
Rod Coutts	Chairman, Navcast Incorporated, Mississauga, Ontario
Savvas Chamberlain	CTO and Chairman, DALSA Corporation, Waterloo, Ontario
Gerry Sullivan	CEO, Energent, Waterloo, Ontario

Six-year Comparison of Total Donations to the Faculty of Engineering

Department/ Defined Area	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Architecture	$22,276.26	$23,804.49	$ 4,829,675.38	$46,237.43	$64,343.89	$179,324.99
BET					$249,703.12	$358,155.10
Chemical[1]	$25,632.11	$2,054,356.53	$43,616.99	$21,745.02	$34,911.24	$38,088.68
Civil & Environmental[2]	$38,916.42	$42,182.13	$27,757.53	$31,036.84	$93,770.78	$28,020.76
Electrical & Computer[3]	$45,683.14	$97,540.53	$88,870.82	$61,111.95	$99,180.35	$32,497.87
Management Sciences	$1,681.76	$1,106.76	$1,806.76	$1,167.03	$844.80	$1,243.29
Mechanical & Mechatronics	$116,105.72	$164,136.80	$88,306.10	$40,267.36	$27,894.44	$44,976.01
Systems Design	$20,624.23	$20,696.39	$24,288.24	$18,762.35	$14,047.16	$16,859.19
Student Teams	$83,551.20	$81,725.30	$41,602.12	$68,662.05	$42,299.49	$90,591.38
Undergraduate Scholarships	$415,148.69	$519,130.81	$545,827.95	$434,432.50	$480,898.15	$307,381.66
Graduate Scholarships	$155,360.64	$168,134.41	$436,495.11	$10,802,637.29	$214,218.07	$254,141.90
Faculty of Engineering	$870,346.94	$333,318.00	$1,634,166.54	$4,535,000.00	$35,250.00	$249,106.50
Equipment & Infrastructure	$5,581,458.63	$487,894.90	$259,064.55	$11,807,097.83	$3,541,652.66	$620,167.39
Other Gifts & Revenue	$4,571,800.00	$1,520,401.00	$5,000.00	$552,192.39	$237,283.85	$635,000.00
TOTAL	$11,948,585.74	$5,514,428.05	$8,026,478.09	$28,420,350.04	$5,136,298.00	$2,855,554.72

NOTES:
1. Includes funds received for Nanotechnology Engineering.
2. Includes funds received for Geological Engineering.
3. Includes funds received for Software Engineering.

F. WOMEN IN ENGINEERING DATA

Women in Engineering Programs, 2009/10

	% Women
First-Year Undergraduate Class	18.6%
All Undergraduate Students	16.7%
Undergraduate Degrees Awarded	15.5%
All Graduate Students	22.0%
All Graduate Degrees Granted	22.5%
Master's Degrees Granted	23.1%
PhD Degrees Granted	20.8%
Professors	12.7%

Women in Architecture, 2009/10

	% Women
First-Year Undergraduate Class	48.6%
All Undergraduate Students	54.3%
Undergraduate Degrees Granted	51.6%
All Graduate Students	49.7%
All Graduate Degrees Granted	71.9%
Professors	37.5%

NOTES:
Undergraduate and graduate students as of November 1, 2009.
Undergraduate students include students on official co-op work term.
Graduate students include full- and part-time students.
Faculty counts as of May 1, 2010.
Professors include all regular faculty members.
Professors exclude definite-term, research and visiting professors.

Five-year Comparison of Women in Engineering Disciplines

	% Women				
	2005	2006	2007	2008	2009
First-Year Undergraduate Class	15.0%	16.7%	15.1%	18.0%	18.6%
All Undergraduate Students	18.0%	17.0%	15.8%	16.1%	16.7%
Undergraduate Degrees Granted	22.4%	21.8%	23.0%	17.7%	15.5%
All Graduate Students	21.0%	22.7%	28.0%	21.4%	22.0%
All Graduate Degrees Granted	21.2%	22.5%	28.4%	25.7%	22.5%
Master's Degrees Granted	22.4%	25.8%	33.0%	26.5%	23.1%
PhD Degrees Granted	17.9%	8.1%	14.0%	22.4%	20.8%
Professors	11.3%	12.0%	12.8%	11.9%	12.7%

Five-year Comparison of Women in Architecture

	% Women				
	2005	2006	2007	2008	2009
First-Year Undergraduate Class	55.0%	47.7%	68.2%	55.4%	48.6%
All Undergraduate Students	58.0%	55.9%	56.6%	56.9%	54.3%
Undergraduate Degrees Granted	45.6%	49.2%	66.0%	62.1%	51.6%
All Graduate Students	57.0%	50.7%	50.0%	51.1%	49.7%
Master's Degrees Granted	56.6%	51.9%	57.0%	50.0%	71.9%
Professors	13.0%	24.0%	36.8%	35.3%	37.5%

G. EXPLANATORY NOTES ON TABLES 1 & 2

1.10 *Sponsored Research Funds ($millions)* percent change reflects change over 2004/05 research funding, which has not been adjusted for inflation.

1.12 *Space Holdings, including Under Construction (nasm)* excludes the School of Architecture and the Conrad Centre for Business, Entrepreneurship and Technology.

1.13 *Budget ($millions)* percent change reflects change over 2004/05 fiscal year budget, which has not been adjusted for inflation.

1.15 *Vision 2010 Campaign progress to date ($millions)* includes cash, gifts in kind and pledges received from May 1, 2006 to September 1, 2010.

2.11 *Sponsored Research Funds/Faculty* excludes the School of Architecture and the Conrad Centre for Business, Entrepreneurship and Technology.

2.12 *Sponsored Research Funds/Budget* excludes the School of Architecture and the Conrad Centre for Business, Entrepreneurship and Technology.

2.14 *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.

2.15 *Endowment/Student* is not restricted to endowments whose funding is available directly to students; rather, it is a normalized indicator to measure the principal in all endowed funds to which the faculty has access.

H. PLANNING COMMITTEE: JUNE, 2009 – JUNE, 2010

Committee Member	Position
Adel Sedra	Dean, Faculty of Engineering Committee Chair
Wayne Loucks	Associate Dean Undergraduate Studies
Wayne Parker	Associate Dean Co-operative Education and Professional Affairs
Peter Douglas (to Sept/09) Richard Culham (Acting Sept/09-June/10)	Associate Dean Graduate Studies and International Agreements
Richard Culham	Associate Dean Research and External Partnerships
Mary Wells	Associate Dean Outreach
Peter Douglas(to Sept/09) Elizabeth Jewkes (Acting from Sept/09)	Associate Dean Computing
Rick Haldenby	Director School of Architecture
Howard Armitage	Executive Director Conrad Centre for Business, Entrepreneurship & Technology
Thomas Duever	Chair Department of Chemical Engineering
Neil Thomson	Chair Department of Civil & Environmental Engineering
Manoj Sachdev	Chair Department of Electrical & Computer Engineering
Elizabeth Jewkes	Chair Department of Management Sciences
Pearl Sullivan	Chair Department of Mechanical & Mechatronics Engineering
Glenn Heppler	Chair Department of Systems Design Engineering
Linda Kenyon	Executive Officer Faculty of Engineering
Ibrahim Inayatali	Director, Development and Alumni Affairs Faculty of Engineering
Martha Foulds Linda Kenyon (Acting Sept/09-July/10)	Director, Planning Faculty of Engineering
Martha Foulds (to Sept/09) Katharin Harkins (Acting Sept/09-June/10)	Director, Communications Faculty of Engineering
Andrea Pinos (to April/10)	Faculty Secretary, Engineering Committee Secretary

I. FACULTY OVERVIEW

Faculty of Engineering Description

The University of Waterloo has its foundation in engineering: over 50 years ago, a few enterprising teachers of engineering and basic science began providing university education to 75 young men who wanted to be engineers. In place from the first day was a co-operative system of education – the first co-op program in Canada – designed to give students practical experience.

From 75 students taught in two prefabricated tin-roofed classrooms, Waterloo Engineering has grown into a multi-faceted engineering school with eight academic departments, home to more than 1800 graduate students, 5950 undergraduate students, over 250 faculty and about 200 staff. Over 31,750 Waterloo Engineering alumni have made their mark in industry, academe, and the public sector, both in Canada and around the world.

Waterloo's undergraduate engineering program, Canada's largest and best, offers degrees in a wide range of disciplines, including chemical, civil, electrical, computer, environmental, geological, management, mechanical, mechatronics, nanotechnology, software, and systems design engineering, and in architecture. Waterloo Engineering is recognized internationally for its co-op program, in which all undergraduates alternate between academic and work terms. This hands-on experience makes students strong leaders, both on campus and off. Fittingly, the faculty's newest building, Engineering 5, both fosters and showcases remarkable undergraduate student achievements in the world-class student design centre at its core.

The Faculty of Engineering is also home to an active and growing graduate student community: more than 1800 exceptional students learn, teach, work, and research here. Each of our eight departments offers graduate programs; there are well over two dozen programs in all. Waterloo Engineering graduate students study with renowned experts, work in world-class laboratories, and fuel the university's drive to expand the frontiers of knowledge and technology.

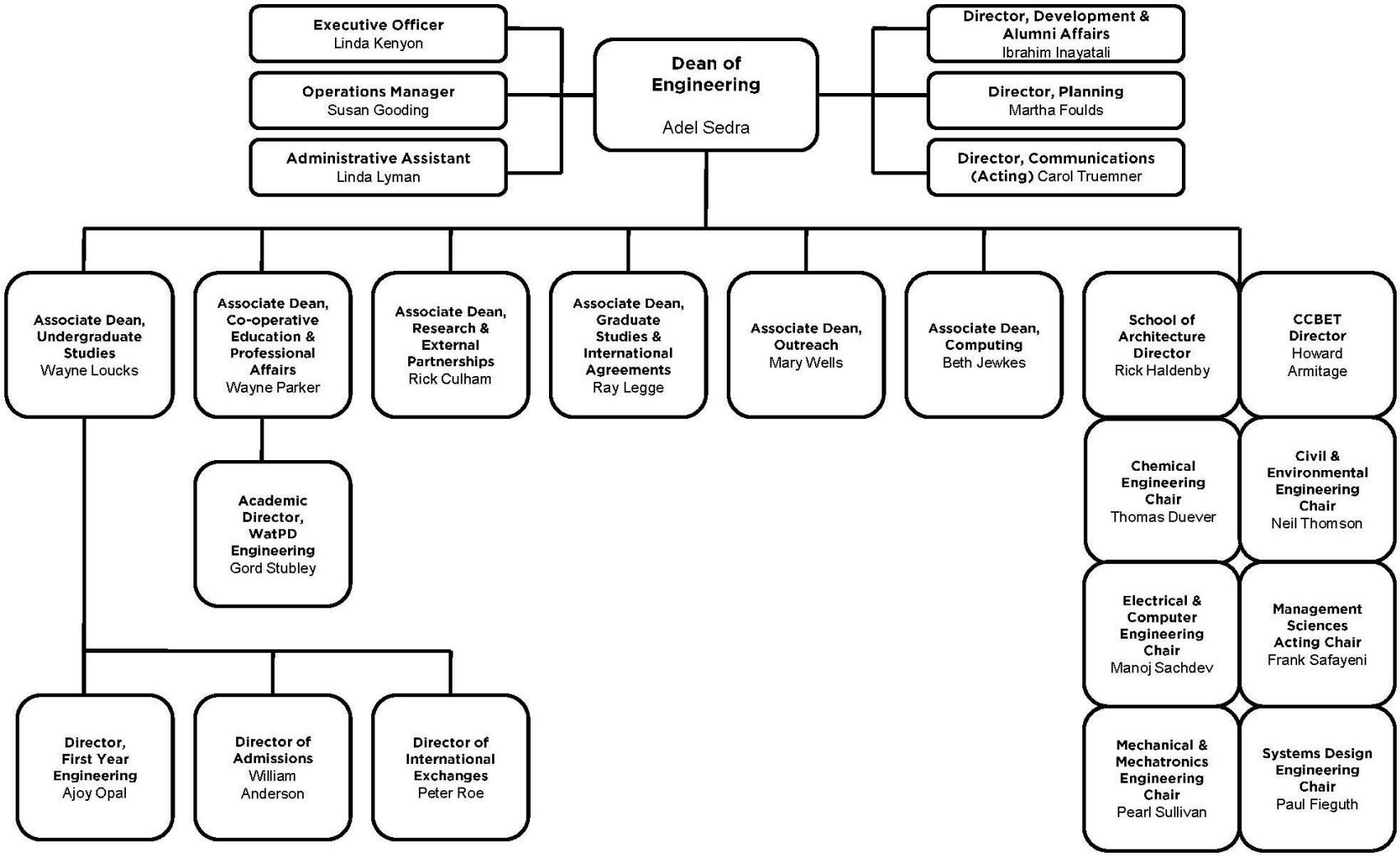
Waterloo Engineering faculty members work to generate new knowledge through research and to disseminate that knowledge through teaching, mentorship and technology transfer. They have an impressive record of achievement that includes 20 Canada Research Chairs, 11 NSERC Industrial Research Chairs, two Ontario Research Chairs, two endowed research chairs, an NSERC Design Chair and 43 Early Researcher Awards/Premier's Research Excellence Awards. Waterloo's unique inventor-owned policy on intellectual property makes us leaders in the transfer of ideas and technology. We recognize that our faculty are key to our quality.

Much has changed since 1957, but Waterloo Engineering's outward-looking philosophy of education has not. The faculty continues to work to integrate research with education, providing students hands-on experience with a solid academic foundation. The research conducted by the Faculty of Engineering benefits people today and shapes the future. The faculty is proud of its reputation for leadership, innovation, and excellence, which has earned Waterloo Engineering global recognition as an excellent engineering school.

Faculty of Engineering Mission Statement

Waterloo Engineering offers professional education of the highest quality across a comprehensive set of engineering and architecture disciplines. We engage in internationally recognized research and design. We build knowledge and intellectual rigour through scholarship, graduate, and undergraduate teaching. Our outward-looking philosophy sets us apart: it is reflected in our commitment to co-operative education, in our extensive regional, national, and international partnerships, and in our research to meet the challenges of today and to shape the future.

J. WATERLOO ENGINEERING ORGANIZATION CHART



Last updated: September 28, 2010

K. INTERDISCIPLINARY UNDERGRADUATE PROGRAMS

Geological Engineering
Director: Dr. Mark Knight, Civil and Environmental Engineering

Mechatronics Engineering
Director: Dr. Sanjeev Bedi, Mechanical and Mechatronics Engineering

Nanotechnology Engineering
Director: Dr. Marios Ioannidis, Chemical Engineering

Software Engineering
Director: Dr. Charles Clarke, Computer Science (Faculty of Mathematics)

L. MAJOR RESEARCH CENTRES AND INSTITUTES

Centre for Control of Emerging Contaminants (CCEC)
Scientific Director: Dr. Wayne Parker, Civil and Environmental Engineering

Waterloo Centre for Automotive Research (WatCAR)
Executive Director: Dr. Amir Khajepour, Mechanical and Mechatronics Engineering

Waterloo Institute for Nanotechnology (WIN)
Executive Director: Dr. Arthur Carty, Chemistry (Faculty of Science), Special Advisor to the President on International Science and Technology Collaboration

Waterloo Institute for Sustainable Energy (WISE)
Executive Director: Dr. Jatin Nathwani, Ontario Research Chair in Public Policy and Sustainable Energy, Faculty of Engineering (Civil Engineering and Management Sciences) and Faculty of Environment