
Queen's University

# Applied Science

## Engineering at Queen's

Fall '05

# A Message from the Dean

It is my pleasure to share with you, several initiatives in the Faculty of Applied Science. Besides the stories and articles in this newsletter, there are some new interesting facts throughout this piece that may surprise you. One of the existing enduring features of Applied Science is the energy and enthusiasm of the engineering students. They are very bright and increasingly concerned about the broader world in which we live. This is reflected in the amazing number of extracurricular activities that extend well beyond "engineering boundaries".

Over the past decade, the Faculty has seen considerable changes in both our undergraduate programs and our programs of graduate education and research. We have devoted considerable resources to improving our curriculum and improving facilities. Part of the motivation stems from the changing needs of graduates to combine strong technical skills with professional skills – the ability to communicate, to work in teams, and to have a better understanding of ethics and the society in which we live. Changes in the workplace are motivating some of this change in education as many companies are outsourcing tasks that only require a sound knowledge of technical skills to lower cost jurisdictions. Additionally, industrial areas are developing, e.g. biotechnology, that require technical skill sets not present in traditional engineering programs. Program evolution also takes into account the aptitudes and attitudes of today's entering students. Our greater understanding of effective methods for teaching and learning also motivates changes in engineering education.

As you will read in these pages, we have constructed a new building – The Integrated Learning Centre, known officially as Beamish-Munro Hall. This facility provides a focus for the team-based, project-based, active learning, which is a key component in our programs. Changes build on our traditional program strengths in mathematics, basic science and design.

Over the next few years, the Faculty will be developing some new initiatives. We require a new facility for the Department of Mechanical and Materials Engineering. This is the largest department in the Faculty. While McLaughlin Hall has served us well for over 55 years, the physical plant is both aged and poorly configured to meet the requirements of 21st century programs of education and research that are underway in this department.

On other fronts, engineering is increasingly practiced on a global scale so we are always exploring opportunities to broaden experiences for our students to have an international perspective in their education through extracurricular activities, exchange options and projects. Also, not surprisingly, we constantly strive to increase resources for the faculty, including Chairs and Professorships. Finally, we feel strongly that we need to provide all qualified students the ability to obtain a Queen's degree through scholarships and bursaries and though we are not completely there yet, we have made wonderful progress on this front. Due to the past generosity and understanding of our alumni, we have been able to move forward on some of these priorities and we thank them for this. Our quest is for continually improving the student experience.

A newsletter is by necessity brief. You are about to read about a few of the teaching and research initiatives underway in the Faculty but please know you are invited to tour the campus or learn more about the Faculty by visiting our Web site at http://appsci.queensu.ca/.

## Quick Facts

561 first year students

2,479 undergraduate students

23% undergraduate students, 22% graduate students and 12% of faculty in Applied Science are female

# A Note from the NSERC Chair in Design Engineering

Queen's solution to the new demands of professional engineering is to maintain the rigour and depth of the curricula but create a practical experience that mimics the realities of the workplace and develops hands-on professional skills required in the workplace. Integrated Learning combines a new active working space, real world practice, and industry partners to create a culture of professional engineering practice.

It was as a member of the Queen's Industrial Advisory Council in 1999, that I first became aware of the proposed evolution in Queen's engineering education now known as "Integrated Learning". The integrated learning philosophy and the related proposal for a novel new facility to support this philosophy was the theme of our meeting. Serendipitously, a year later the meeting theme was "Design in Engineering" – a topic of great personal interest to me and a fundamental aspect of the Integrated Learning thrust. Little did I know that three years later I would leave industry in order to accept a faculty-wide appointment in Applied Science at Queen's as the Natural Sciences and Engineering Research Council (NSERC) Chair in Design Engineering (CDE), and in turn, become a member of the Integrated Learning team.

Increasing economic growth and productivity in a knowledge-based global economy requires more creativity and innovation. NSERC's intention was very clear in the CDE prospectus – Canada is experiencing a shortage of people with the skills and knowledge to make innovation happen. "Specifically, we lack design engineers… the enablers of innovation; and if we want to become more successful in innovation, we have to educate and train more of them." To address this issue, NSERC has established eleven Chairs in Design Engineering across Canada, and has allocated funds for up to five more. While each Chair is unique in order to best suit the institution and the chair-holder's background, the goal of enhancing design and innovation skills in Canadian engineering graduates is consistent. Queen's was awarded one of these Chairs in part due to the excellent fit with its integrated learning philosophy.

The Design Chairs are working cooperatively to enhance traditional engineering courses with programs that inspire innovation, leadership and vision. At Queen's, our Design Chair program is built on the premise that successful engineering design and innovation requires a broad range of knowledge, skills, and attitudes. While technical competence is fundamental, success is measured by the engineer's ability to creatively and competently apply technical skills in multi-disciplinary design teams in a competitive business climate, in compliance with regulatory standards and intellectual property rights, and with respect to social, cultural, and environmental issues.

Amongst many other new initiatives at Queen's, we have introduced a new elective Multidisciplinary Design Engineering Stream comprised of a series of courses emphasizing design methodologies, reliability, risk, intellectual property, project management, and engineering economics. These fundamental engineering skills and techniques are developed and concurrently applied to actual engineering scenarios in a multidisciplinary project-based environment. Capping the stream and operating for the first time this year is the successive two term, industry based multidisciplinary team design project, co-mentored by industry engineers and academics. Tackling real industry projects, students have the opportunity to gain invaluable engineering experience while still in their academic program.

Integral to the successful implementation of many of these curriculum initiatives, and the home of Integrated Learning, is our new world class facility, Beamish-Munro Hall. This harmonious combination of new programs and facilities is truly unique in Canadian engineering education.

The Faculty of Applied Science at Queen's has consistently been recognized for excellence in its engineering programs. By combining NSERC's vision for innovative design engineers with the breadth of educational initiatives offered through Integrated Learning, we believe our engineering graduates will continue to demonstrate that standard of excellence.

David S. Strong, P. Eng.
Professor and NSERC Chair in
Design Engineering
Queen's University B.Sc. (Mechanical) 1981
http://appsci.queensu.ca/ilc/people/strong/

# Beamish-Munro Hall

Opened in May 2004, Beamish-Munro Hall is a unique and exciting learning facility, where education becomes action. It has been instrumented as a working laboratory or "live building", where students are able to observe, monitor and manipulate selected building systems, including renewable energy alternatives. All of the internal and external systems, from heating and ventilation to wind speed, are available to view in real-time on the Web. You can see it for yourself at http://appsci.queensu.ca/ilc/.

Prior to the building opening to Queen's students, the Engineering Society ran summer camps, Science Quest (elementary school students) and Engenuity (female high school students), in Beamish-Munro Hall and enjoyed the versatility and computer functions of the Centre. During the 2004-05 school year, 53 courses, representing 12 programs and all years of engineering disciplines, were run. The Atrium held a number of diverse events including a theatre production, many receptions and a Town Hall meeting with astronaut Chris Hadfield. The 43 group rooms, which are used by the students as they wish, are full night and day.

The building was undoubtedly a huge success with faculty, staff and students but it also impressed the architects of the world. Beamish-Munro Hall won the Fourth International Green Building Challenge 2005, which was awarded by the Sustainable Buildings 05 Canadian Team, and the 2005 Innovation in Architecture Award from the Royal Architectural Institute of Canada. As well, the building was quite favourably reviewed in *Canadian Architecture*, in January 2005. This award winning building contains:

### GREEN INITIATIVES

As you enter the building from the main entrance, our extraordinary three-story green wall will greet you; a living, self-sustaining air filter for the office clusters. In addition, the ILC uses and demonstrates green technology—photovoltaic array, fuel cell, energy efficient light, and a biofiltration system. To learn more about the "green" technologies at the ILC, visit http://ilc.queensu.ca/facilities/greenBuilding/.

### THE DESIGN STUDIO

The Design Studio supports twelve teams of students working on major design projects. Each team has a high-end CAD workstation with appropriate software for all engineering disciplines.

### THE PROTOTYPING CENTRE

In conjunction with the Design Studio, the Prototyping Centre provides the mechanical and electronic equipment needed for manufacturing new designs. The facility supports both electronic and mechanical aspects of manufacture and includes a 3D printer and electronic assembly benches.

### THE MULTIMEDIA FACILITY

The Multimedia Facility contains equipment for audiovisual presentations and video-conferencing, allowing students to develop and refine their presentation skills.

### THE COMPETITIVE TEAM SPACE

These facilities are currently providing space for eight competitive design teams for ongoing manufacturing, assembly and storage of projects.

### THE TEACHING STUDIO

The oval-shaped Teaching Studio allows students to watch, learn and apply new skills all in the same room and at the same time. Students can face centrally toward the instructor or outwardly toward a bench equipped with a computer and experimental equipment.

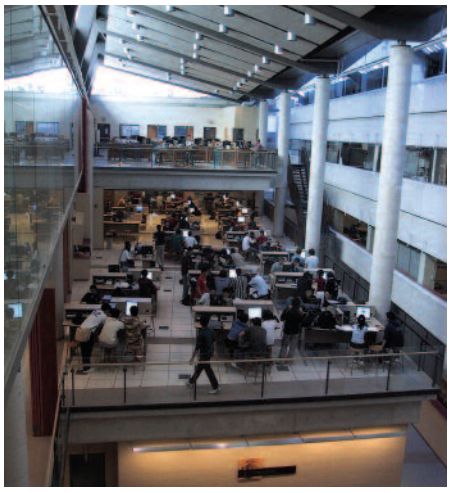
### THE ACTIVE LEARNING CENTRE

The Active Learning Centre is a modular room that instructors and students can quickly reconfigure to their needs.

### FIRST YEAR STUDIOS

These two studios combine as many first-year needs into one room as possible: group work and discussion areas, benches for manual work, a range of hand tools, computers and lockers for student projects.

The ILC erases the divisions between lecture halls and laboratories, between tutorials and practice. Moreover, it blurs the boundaries between individual students and focuses on the team project. The objective of the ILC is to produce graduates who understand some of the complexities of real-world engineering—and who know how to roll up their sleeves and get to work.



Plazas
A total of 66 benches instrumented with equipment that can be adapted for many applied science labs may be found on two floors of plaza space, just off the Atrium. Each bench is equipped with standard electronic measurement equipment and additional equipment is stored for specialized laboratory sessions.

Living Wall

# Students who make a difference...

Integrating theory and lessons into real-life activities is just part of the fun of being an engineer. One group of students has put Queen's on the international map for designing recreational cars that have vroom!

## MINI-BAJA RACING: MUD, SWEAT AND GEARS

The Queen's Mini-Baja student design team is a multidisciplinary group of about twenty students who come together each school year to design and build an off-road vehicle that can survive the severe punishment of rough terrain while racing against universities from across North America. If you have ever been to the off-road trails or abandoned hydro corridors north of Kingston, you would recognize Queen's Mini-Baja vehicle and the team of students who build and drive it. Otherwise, Mini-Baja may be one of the best kept secrets on campus.

"Off-roading is an attitude," the students say. And after several top ten finishes in past years, they still have that attitude. The Queen's Mini-Baja Race team competes in three competitions across North American every year; the East, West, and Midwest. The East was held in Rochester, New York, USA. The West was held in Tucson, Arizona, USA and The Midwest was held in Troy, Ohio, USA. The team was determined that the 2005 vehicle was going to be a contender for a first place finish.

The Mini-Baja project, like most student design teams, simulates real-world engineering design projects and their related challenges. It's integrated learning in action. Student members get to apply the knowledge learned in the classroom to plan, design, test and fabricate a car according to 83 pages of rules; the car must pass a strict safety inspection to qualify for competition. Teams are also judged for marketing potential—how well they have targeted their design to be accepted for manufacturing by a fictitious firm. The Mini-Baja project bridges the gap between design and fabrication, giving the students the opportunity to make mistakes before they enter industry, where there is no room for error.

The 2005 team had an outstanding racing season. The Queen's University team is now notorious at these races for producing fast and light cars, being professional, having good sportsmanship, and always being one of the top teams at every competition.

Adam Coombs, last year's Team Manager began the 2005 racing season by saying, "We have designed and manufactured a custom lightweight gearbox, fully redesigned the front and rear suspension, and our frame has been fully optimized using various types of engineering software. Each year, we improve upon what didn't work well from last season's car, and every year the car just gets better and better." He adds that it is key to keep recruiting first-year students: "If fourth year members graduate with all the understanding, the new team will end up starting all over again."

Adam's determination and planning has paid off. The current Team Manager, Andrew Weaver reports, "We did very well in the 2005 season. Our first competition, the SAE Mini-Baja East, was held in Rochester, NY on May 5th. We finished the four-hour endurance race in second place and placed fourth overall out of 65 teams. The second competition was a special event to celebrate the 100th anniversary of SAE that was called the SAE Mini-Baja 100 in Tucson, AZ. We built on our success at the East, winning the first ever Mini-Baja 100 mile endurance race! We ended up placing third out of 119 teams."

In addition to building the car and racing it, the Mini-Baja team generates their own financial support for the project through product donations and financial sponsorship. Currently, Queen's Applied Science, SKF Bearings, the SAE Ottawa section, Bonnel Canada, DOW Chemical, Goodyear and many local Kingston businesses support the team. The alumni of Sci '73 have recently declared the Mini-Baja team as their designated project and offer significant financial support to the team through class giving.

For more information about the team, please visit the Mini-Baja website at: www.engsoc.queensu.ca/minibaja.

# ...wherever they are

Compassion, principles, and a deep awareness of the needs of the world are some of the characteristics of the new engineering student. They are not content to simply build their own careers, they are striving to make a better world.

### WHAT DO NUNAVUT, SOUTH AMERICA AND WEST AFRICA ALL HAVE IN COMMON DURING THE SUMMER MONTHS?

If you answered Queen's students, you are correct. Every summer since 1990, members of the Queen's Project on International Development (QPID) have traveled far and wide to carry out community focused, sustainable development projects. The projects these students participate in can range from literacy & leadership camps in Baker, Nunavut, to the repair of rainwater catchment tanks in Wakapoa, Guyana. In the summer of 2005, a team of Applied Science students traveled to Bolivia to work on projects in environmental waste management, erosion protection and safe housing programs, all designed to help develop standards to address health-related housing issues.

When this non-profit, volunteer initiative began, there were only 20 members. Now QPID has over 150 current members from all faculties and hundreds more alumni members. In 1998, QPID expanded its efforts into the Kingston community. Projects such as The Kingston Youth Shelter's Drop-in Centre; the Support, Encourage, Enhance Project (S.E.E. – school workshops on international development) and the QPID Fair Trade Coffee Initiative are new local projects. More recently, the group has initiated workshops on environmental sustainability.

In 2005, QPID ventured into a new continent. Two French-speaking students spent their summer traveling to the two Francophone countries of Burkina Faso and Mali in order to seek out and plan future projects for Queen's students. This involved building working relationships with prospective partner organizations and preliminary needs assessments and evaluation.

Bronwyn and Lillian showoff a solar cooker in Bolivia

Though seventeen QPID students spent their summers in 2005 carrying out these projects, over one hundred more spent the 2004-05 school year toiling in preparation. From September to April, teams from each project raise sponsorship funds, put in grant applications, arrange travel, prepare equipment and teaching materials, establish safety nets in each country, and perform countless other administrative tasks. These hands-on experiences expose students to important development issues in cross-cultural settings. Furthermore, it provides them with the opportunity to apply what they know in an interdisciplinary working environment, which makes for more dynamic and socially conscious engineers—engineers who care.

To find out more, please visit their Web site at http://engsoc.queensu.ca/qpid

### QUEEN'S FIRST CANADIAN UNIVERSITY TO JOIN CDIO

The Department of Mechanical and Materials Engineering at Queen's has broken new ground by becoming the first Canadian university to join CDIO (Conceive – Design – Implement – Operate). As part of this international initiative, Queen's will participate with eight other world-class universities to develop innovative engineering curriculum that will produce the next generation of engineering leaders.

CDIO and Queen's both feel this will prove to be a very good fit. On one side, CDIO collaborators feel that they will benefit substantially from Queen's unique strengths and expertise according to William Litant, Director of Collaborator Development, CDIO, in his letter inviting Queen's to join the initiative in December. On the other side, Urs Wyss, Head of Mechanical and Materials Engineering says, "CDIO is a good fit for Mechanical and Materials Engineering because they share what we want to promote and address soft skills such as project-based learning, communications and group dynamics."

# Engineers Research Solutions to Problems

Individual research excellence is still a proud feature of Queen's Applied Science. Increasingly research that crosses disciplines and combines technologies to find solutions to complex problems is an exciting addition to "siloed" research. Specialized labs and design projects, where teams of researchers from many faculties and departments collaborate, are scattered across campus—and are earning new accolades for Queen's. For a complete list of centres, institutes and labs at Queen's, visit www.queensu.ca/secretariat/senate/centres.html

HMRC's Computer-assisted surgery

### THE HUMAN MOBILITY RESEARCH CENTRE

The investigators at the Human Mobility Research Centre (HMRC) are passionate about enabling people to move freely and painlessly. They are international leaders in the prevention and treatment of bone joint disorders caused by arthritis, osteoporosis and injury. Engineers, chemists, health care professionals and computer scientists work side by side at the HMRC—a partnership between Queen's University and Kingston General Hospital—to help those with musculoskeletal conditions lead more active lives. The centre's specialized labs include facilities dedicated to prosthesis design, tissue engineering, computer-assisted surgery, and motion analysis.

The primary goal is to prevent the need for major surgical procedures, such as total joint replacement, for as long as possible. Researchers focus on innovative approaches to prevent and repair musculosketal damage.

Investigators from Applied Science play a pivotal role in the Centre's development of less invasive treatments. Mechanical engineers have pioneered simple, reasonably priced mechanical devices for people with disabilities, such as a durable artificial foot for amputees in post-conflict nations. They are also using their knowledge of the biomechanics of the knees, hands, wrists and spine to design a new generation of artificial joints. Chemical engineering researchers are working on methods to repair or produce functional cartilage and bones without disturbing surrounding healthy tissue.

Restricted mobility is a crucial research area because it can seriously compromise quality of life and health, potentially leading to disabilities and burdens on the health care system. It's also an excellent arena for student engineers to learn about the vital connections between engineering and human life.

### THE FUEL CELL RESEARCH CENTRE

Research at the Queen's-RMC Fuel Cell Research Centre (FCRC) are really initiatives to reduce our dependance on fossil fuels. Today, the vast majority of cars, trains, planes and power plants still use fossil fuels. But the social and economic costs of the fossil fuel economy are environmental degradation, global climate instability, and dependence on exports from oil-producing nations.

In contrast, fuel cells run on hydrogen, with only water as a waste product. But current production methods for hydrogen are prohibitively expensive, and hydrogen-fuelled cars are still not commercially viable.

Enter the Queen's-RMC FCRC. With its consortium of researchers, industry and government partners, it has the combined expertise to tackle major technological problems involved in fuel cell applications. The FCRC is one of the largest university-based fuel cell research and development initiatives in Canada.

Several researchers are investigating the best ways to produce and store hydrogen for fuel cells, while others are testing the reliability and durability of fuel cell components. The common imperative in all these studies is to reduce the cost of fuel cells through innovations in materials, design and manufacturing.

# Two Consecutive Engineering Students Serve as Rector

Grant Bishop and Ahmed Kayssi

The Faculty of Applied Science attracts many energetic and ambitious students and Ahmed "KC" Kayssi (Sci '03, Artsci '03) and Grant Bishop (Sci '03, M.Sc. '06) are two shining examples. They are the University's past and present Rectors. This prestigious post represents all undergraduate and graduate students to the university. Serving on university governing bodies, including the Board of Trustees and Senate, and on numerous committees, the Rector voices student concerns and promotes educational excellence. Additionally, the role involves many ceremonial functions, including sitting on stage with the Chancellor and the Principal at convocations and conferring of awards; acting as an advisor to and advocate for students in grievance procedures; and promoting scholarly dialogue amongst students – notably through public speaker forums.

While serving as the 28th Rector, from 2002 to 2004, Ahmed earned a dual degree in Engineering Chemistry and Business German. He finished a MSc in Physiology this spring and started medical school in September. During his time at Queen's, Ahmed founded the Arab Students Association and has served with the Residence, Arts and Science, Engineering, and Alma Mater Societies. To promote debate on campus, he organized and moderated panel discussions on free speech and Canada-US relations. He helped in the development of the concept of the Rector's Badge as well as traveled to Scotland and Northern Ireland to raise his university's colours on five local campuses as a student-aid fundraising initiative. His good natured, kilted presence at Convocations during his time as Rector will be remembered by everyone attending.

In November of 2004, Grant was elected by the student body as the 29th Rector. A former President of the Engineering Society, he has a particular interest in sustainability and development issues and is currently pursuing graduate studies towards a Master of Environmental Studies degree from the School of Environmental Studies. He is a recipient of the Agnes Benidickson Tricolour Award – the highest tribute that can be paid to a student for valuable and distinguished service to the Queen's University in non-athletic, extra-curricular activities. Never shy about speaking out, Grant has been a campaigner throughout his time at Queen's on many issues.

Expect to hear more from both gentlemen over the next few decades.

## Quick Facts

Research Funding: 15 million in Applied Science and approximately $12 million in Engineering Science (Arts and Science)

Each faculty member has on average 4 graduate students

There are 17 Applied Science students participating in International Exchange Opportunities in the 2005-06 school year

6% of undergraduate and 21% of graduate students are international students

Faculty was established in 1893

VP Research and Civil Engineering Professor, Kerry Rowe, was awarded the 2004 Killam Prize

The Queen's Undergraduate Internship Program is a great program for Engineering students

### CHEMICAL ENGINEERING PROGRAM: BIOCHEMICAL ENGINEERING OPTION

The development of techniques in molecular biology that now allow for the transfer of genetic material from one life form to another has revolutionized our capacity to utilize microbial, plant and animal systems for the benefit of humankind, and has led to the emergence of a multibillion dollar, and multinational, Biotechnology Industry within a mere 20 years. From a Chemical Engineering perspective, this has meant that the area of Biochemical Engineering, traditionally an important albeit a modest sub-discipline, has been transformed into an essential constituent of many / most Chemical Engineering Departments, and has been shown to be a critical factor in the success of the Biotechnology Industry itself. At the same time, concerns about health effects arising from the emissions of industrial activity have led to an increased importance of, and requirement for, Environmental Engineering expertise.

The Department of Chemical Engineering at Queen's, traditionally very active in teaching and research in Biochemical Engineering, has now formally organized its undergraduate curriculum to permit specialization in Biochemical Engineering. We have, through the restructuring of existing course offerings, the addition of new core courses, and the inclusion of elective courses in the Life Sciences, formulated an Option in Biochemical Engineering (BE). The BE Option, while retaining the key elements of Chemical Engineering, provides students with the opportunity to focus on one of two streams, Biochemical / Biomedical Engineering or Environmental Engineering, and does so within a strong engineering framework. Thus, students selecting the BE Option, can choose to pursue instruction leading to potential careers in the Biotechnology Industry, while others can focus on gaining expertise in environmental technologies.

# Thanks to you!

From the student award that provides the necessary funds for one student to complete their degree to the construction of a facility that impacts thousands of current and future students, the generosity of alumni has been a powerful agent of change in Queen's Applied Science.

Engineering alumni are among the most generous of all alumni at Queen's. During the enormously successful Campaign for Queen's, Applied Science alumni donated over $32 million to support new projects and programs. This financial support has ensured that today's students have a truly remarkable educational experience.

The Faculty of Applied Science has been able to chart bold new paths in engineering education because of your support. Your time, your energy, your vision and your generous support make this Faculty a leader in North America.

You attend our events, you encourage your family members to enrol, you speak to our students in seminars and conferences, you provide your expertise and advice through mentoring and internship placements, and you trust us with your donations. Because you recognize that you were the beneficiaries of the legacy of previous alumni, you continue to ensure that this legacy will live on.

Kathy O'Brien, Joanne Grills and Kim Garrison: Your Advancement Team.

## BEYOND FINANCIAL DONATIONS

The real world is the focus of the new curriculum. Gone are the days when engineers lived in a solely technical environment. Today's engineering students are politically, environmentally and socially engaged and eager to solve complex problems.

Donations from alumni help make these programs happen for our bright, deserving students. But with the integrated learning focus, your presence and participation are just as important as your financial assistance. Our goal is to give students a taste of real-world engineering through mentorships, guest lectures, and individual or industry linked partnerships. Only you can give that to this year's students.

Please consider coming back to Queen's to tour the new Beamish-Munro Hall and meet these future engineers for yourself. Your participation in the program would be most welcome.

## HOW CAN YOU HELP?

Provide us with your views and thoughts on the Integrated Learning initiative.

Get involved through
- guest lecturing
- mentoring individuals
- supervising project teams
- providing industry based projects
- participating in the Queen's Internship Program.

Call the Integrated Learning Centre at 613.533.3130

## FACULTY OF APPLIED SCIENCE ENROLMENT 2005-06

Undergraduate Enrolment

| Year | 1 | | 2 | | 3 | | 4 | | |
|---|---|---|---|---|---|---|---|---|---|
| Full-Time/Part-Time | FT | PT | FT | PT | FT | PT | FT | PT | Total |
| Program | | | | | | | | | |
| First Year | 561 | | | | | | | | 561 |
| Chemical Engineering | | | 74 | 2 | 69 | 2 | 73 | 2 | 222 |
| Engineering Chemistry[1] | | | 36 | | 37 | 1 | 27 | 3 | 104 |
| Civil Engineering | | | 77 | 2 | 100 | | 78 | 5 | 262 |
| Computer Engineering | | | 18 | 1 | 27 | 2 | 57 | 21 | 126 |
| Electrical Engineering | | | 58 | 1 | 87 | | 107 | 25 | 278 |
| Geological Engineering [1] | | | 26 | | 28 | | 25 | 3 | 82 |
| Mathematics and Engineering [1] | | | 37 | | 45 | | 31 | 4 | 117 |
| Mechanical Engineering | | | 150 | 1 | 159 | 2 | 149 | 17 | 478 |
| Mining Engineering | | | 29 | 2 | 33 | | 25 | 6 | 95 |
| Engineering Physics[1] | | | 34 | | 41 | | 62 | 17 | 154 |
| Total Full-Time | 561 | | 539 | | 626 | | 634 | | 2360 |
| Total Part-Time | | 0 | | 9 | | 7 | | 103 | 119 |
| Total Full-Time and Part-Time | 561 | | 548 | | 633 | | 737 | | 2479 |

Queen's University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