

WATERLOO | ENGINEERING

facts
2016/2017

Engineering 5 is home to the world-leading Sedra Student Design Centre.



**UNIVERSITY OF
WATERLOO**



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Through our Engineering Ideas Clinic™ students are introduced early on to hands-on learning — assembling brushless DC motors.

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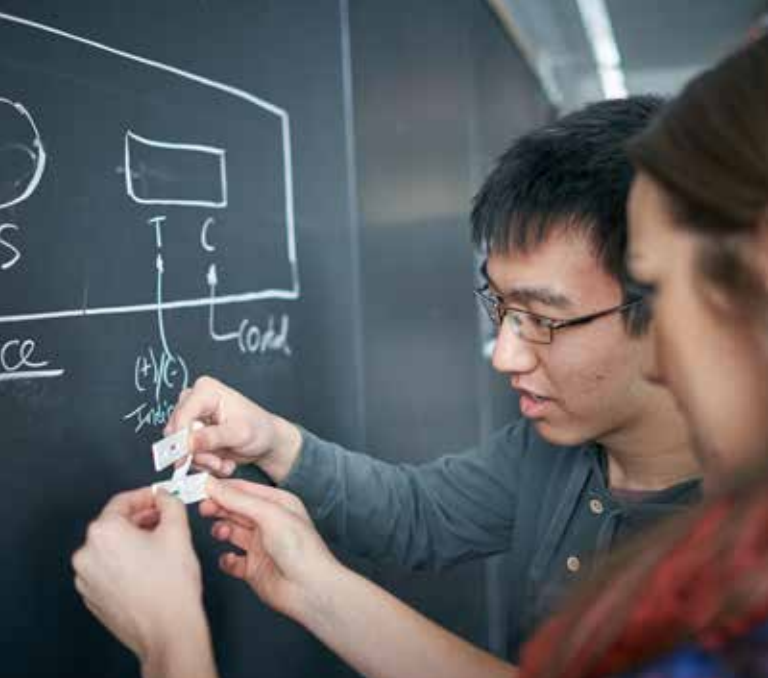
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university of waterloo

Located at the heart of Canada's Technology Triangle, the University of Waterloo is one of the country's leading comprehensive universities with over 36,000 full- and part-time students in undergraduate and graduate programs. By bringing innovative minds and ideas together, Waterloo inspires breakthroughs with real-world relevance and impact.

Waterloo is consistently ranked Canada's most innovative university. It is home to the country's largest engineering school, which is recognized as one of the top 50 engineering schools worldwide. Waterloo Engineering's reputation for excellence is built on the foundation of co-op education, dedication to transformational research and an unmatched culture of entrepreneurship.



Students in the University's new Biomedical Engineering program.

The University of Waterloo ... has become a magnet for recruiters at Google parent Alphabet Inc., Electronic Arts Inc. and Amazon.com Inc., who seek the school's entrepreneurially minded engineering graduates.

— **THE WALL STREET JOURNAL**
May 2016

the waterloo story



WANTED:

150,000

Engineers and Technicians

It was the highlight of a 1956 editorial in the *Globe and Mail*, widely regarded as Canada's national newspaper, and also the title of a Rotary Club speech

given the same year by Ira Needles. Needles, an executive with B.F. Goodrich Canada, along with Gerald Hagey, Waterloo's founding president, and Reverend Cornelius Siegfried, helped launch the University of Waterloo in 1957 to fill the need for skilled engineers and technicians in Canada's growing postwar economy.

The University of Waterloo is now an internationally recognized leader in advancing knowledge and research. From developing the Waterloo Pump that helps developing nations bring clean water to communities to creating the world's first single-chip atomic force microscope, Waterloo fosters worldwide technology discoveries.

Experiential learning takes place within a supportive environment that encourages students to explore new paths and address the challenges of today and tomorrow. The opportunity to learn in such a relevant way attracts the best and brightest students and faculty members from across Canada and around the world.

With a reputation built on an entrenched entrepreneurial ecosystem, Waterloo is widely known for having more startups formed by its faculty, students and alumni than any other Canadian university.



Waterloo's main campus is located on 1,100 acres of land in Uptown Waterloo, adjacent to Waterloo Park.

Waterloo, Ontario, Canada

With one of the youngest populations in Canada, Waterloo is a student-focused city. The community is a rich mosaic of culture, history, technology and innovation. It's a place where both industry-leading businesses and hundreds of startups thrive, and where world-class arts and entertainment events bring the city to life.

canada's most innovative university by the numbers



PEOPLE

30,600

undergraduate

5,300

graduate students



15% international undergraduate

36%

international graduate students



1,139

full-time faculty

322



international faculty

182,000 >> **145**

alumni in
countries

SIZE AND SCOPE

1,100-acre

main campus in Waterloo



satellite campuses

reinvigorating city cores across Kitchener, Cambridge and Stratford, Ontario



\$2.6 B

per year in economic impact in Ontario (2013 Economic Impact Report)



6 FACULTIES

Applied Health Sciences
Arts
Engineering
Environment
Mathematics
Science

11 PROFESSIONAL SCHOOLS

- » Accounting and Finance (Arts)
- » Architecture (Engineering)
- » Balsillie School of International Affairs (Arts)
- » David R. Cheriton School of Computer Science (Mathematics)
- » Optometry and Vision Science (Science)
- » Pharmacy (Science)
- » Planning (Environment)
- » Public Health and Health Systems (Applied Health Sciences)
- » Environment, Enterprise and Development (Environment)
- » Environment, Resources and Sustainability (Environment)
- » Social Work (Renison)

WORLD-CHANGING RESEARCH



TOP Comprehensive Research University in Canada for **8 consecutive years** (Research Infosource)

\$183M



in research funding from external sources — government, foundations, industry, non-profit (2015-16)

#1 **COMPREHENSIVE** Canadian university

for SSHRC grants, supporting social sciences and humanities research, for 7 consecutive years

31%

of research funding from industry partnerships (Office of Research)

more than

\$20M



in research funding from **international partners**

4 AFFILIATED AND FEDERATED INSTITUTIONS

- » Conrad Grebel University College
- » Renison University College
- » St. Jerome's University
- » St. Paul's University College

GLOBE-SPANNING RESEARCH PARTNERSHIPS WITH COMPANIES AND ORGANIZATIONS INCLUDING:

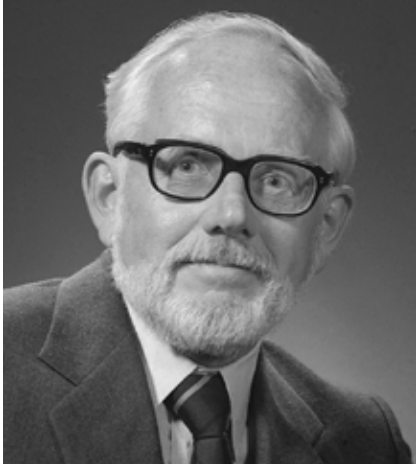
- » World Bank
- » NATO
- » United Nations
- » World Health Organization
- » Bill & Melinda Gates Foundation
- » World Vision Canada

waterloo engineering

In July 1957, 74 young men started engineering classes in two tin-roofed portables located in a parking lot at what was then Waterloo College Associate Faculties. Three months later, they began their first co-op work term, the first educational work term anywhere in Canada. As one of the original 74 recalls, many people didn't understand the co-op concept. For the first few years, he had to answer questions about how it worked. Soon, however, there was no need to explain — **Waterloo Engineering had become synonymous with co-op.**

Some of the first Waterloo Engineering students.





Douglas Wright, the University of Waterloo's first dean of engineering.

In 1958, students gathered their books and moved to what is now the University of Waterloo campus. Part of Waterloo Engineering's young history went along with the students — the portables were cut in half, trucked over the hill and became drafting halls and cafeterias.

Soon, construction began on E1, the first academic building on the new site, today known as the Douglas Wright Engineering (DWE) building, named after Douglas Wright, Waterloo's first dean of engineering and also president of the University of Waterloo from 1981 to 1993.

Today, Waterloo Engineering is Canada's largest school of engineering and the most sought-after destination for undergraduate students.

historic milestones

- 1957 »** Waterloo College Associate Faculties (incorporated as University of Waterloo in 1959) is founded with chemical, civil, electrical and mechanical engineering, and engineering physics program
- » The first co-op education program is launched in Canada
- 1961 »** Engineering 2 and Engineering 3 buildings constructed
- 1962 »** First engineering degrees awarded



- 1964 »** Engineering enrolment at 550 students, the largest in Canada. Co-op grows to include more than 400 Canadian corporations and organizations in six provinces
- 1965 »** The management and systems design engineering (MAsc and PhD) programs launch and engineering physics program ends

1966 » The management sciences program launches (formerly management and systems design engineering)

1967 » The Engineering Lecture Hall is built. It is later renamed J.R. Coutts Engineering Lecture Hall in honour of Rod Coutts, an electrical engineering alumnus

» Professional architecture program launches

1969 » The systems design engineering program and environmental studies division launch

1971 » Engineering 4 is built. It is later renamed Carl A. Pollock Hall to honour a university founder and chancellor

1972 » Intellectual property policy introduced

1978 » The Waterloo Pump is designed in Waterloo Engineering to help developing nations bring clean water to communities. It's still in use today



1979 » The School of Architecture opens its studio in Rome, Italy

1984 » The computer engineering program launches

1990 » First Midnight Sun solar car is unveiled by engineering students at the cost of \$116,000

» Waterloo Engineering Endowment Foundation (WEEF) is founded by undergraduate students to benefit undergraduate engineering education. Now over \$14 million, it is the biggest student-run endowment fund in Canada

» Engineering Science Quest summer camps launch

1995 » Waterluge, a concrete toboggan built by a team of engineering students, captures first place at the Great Northern Concrete Toboggan Race in Montreal

1999 » With its genesis in Waterloo Engineering, the first BlackBerry phone hits the market

2000 » Engineers Without Borders Canada, an international development organization, is started by two engineering graduates

2001 » The software engineering program launches

2003 » The mechatronics engineering program launches and the Centre for Environmental and Information Technology is constructed

2004 » Midnight Sun VII sets Guinness World Record for the “longest journey by a solar electric vehicle” by travelling 15,070 km through Canada and the United States



2005 » The nanotechnology engineering program launches

» The School of Architecture, part of Waterloo Engineering for its first two years (1967-69), returns to its roots after 36 years in Environmental Studies

» Waterloo's Alternative Fuels Team — the only Canadian team participating — triumphs over 16 top U.S. universities to win first place at the Challenge X competition

2007» The University's Centre for Business, Entrepreneurship and Technology joins Waterloo Engineering – four years later, “Conrad” is added to its name



- » The mechanical engineering department is renamed mechanical and mechatronics engineering
- » Management engineering launches
- » Waterloo Engineering and the University of Waterloo mark 50th anniversary

2010 » Engineering 5, home to mechanical and mechatronics engineering, systems design engineering, and electrical and computer engineering, opens. Features include two-storey, 20,000-square-foot student design centre, now known as the Sedra Student Design Centre

2011 » Engineering 6, the new home for chemical engineering, opens

2012 » Stephen Hawking helps open the Mike & Ophelia Lazaridis Quantum-Nano Centre, which houses the nanotechnology engineering program and the University's Institute for Quantum Computing



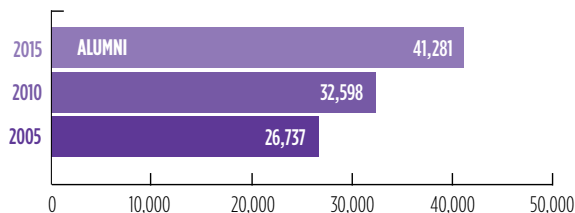
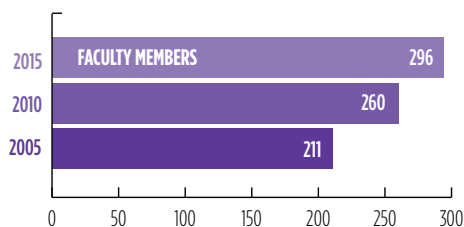
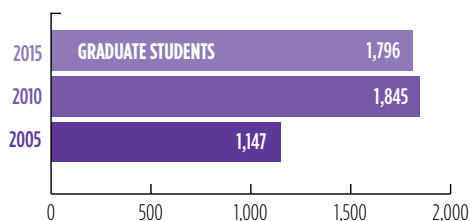
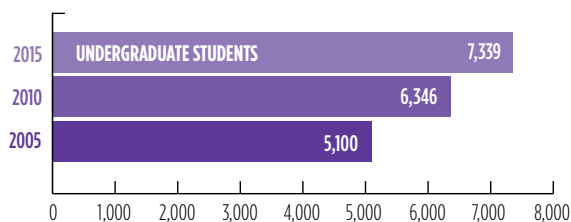
- 2012** » The Centre for Bioengineering and Biotechnology is established
- 2014** » The biomedical engineering program launches
- » Waterloo Engineering awards the most engineering doctoral degrees (125) in Canada
- 2015** » Construction begins on Engineering 7. The building will house the Engineering Ideas Clinic™, a Multiscale Additive Manufacturing (3D Printing) laboratory and RoboHub, which will support testing of aerial, mobile and magnetically levitated robots. It will also accommodate the expansion of mechatronics engineering and biomedical engineering and much more



ENGINEERING DEANS

- » **Doug Wright:** 1958 – 1959 (acting), 1959 – 1966
- » **Archie Sherbourne:** 1966 – 1974
- » **Wally McLaughlin:** 1974 – 1982
- » **Bill Lennox:** 1982 – 1990
- » **David Burns:** 1990 – 1998
- » **Sujeet Chaudhuri:** 1998 – 2003
- » **Adel Sedra:** 2003 – 2012
- » **Pearl Sullivan:** 2012 - present

Growth of Waterloo Engineering 2005-2015



world rankings 2015

Waterloo Engineering consistently ranks among the top Canadian engineering faculties, as well as ranking highly throughout the world.

	CANADIAN RANK	GLOBAL RANK
Academic Ranking of World Universities (Shanghai Rankings)	2	47
QS World University Rankings	4	74
Taiwan Rankings	2	60
Times Higher Education World University Rankings	4	61
US News and World Report Best Global Universities	2	47

The University of Waterloo ... is one of the world's best technology schools ... [attracting] prominent faculty members from around the world as well as Canada's top engineering and computer science students.

— **THE NEW YORK TIMES**
February 2013



PhD Candidate Shahid Haider is developing technology that will make managing diabetes easier.

engineering's academic units

Waterloo Engineering is comprised of eight academic units:

The School of Architecture has been ranked first in offering the greenest architecture curriculum in Canada.



School of Architecture

- » An international leader in design education and research, it's the only Canadian school of architecture to have a permanent international location: the Waterloo Studio in Rome, Italy

Chemical Engineering

- » One of Canada's largest chemical engineering undergraduate programs, graduating an estimated 10 per cent of the country's working chemical engineers

Civil and Environmental Engineering

- » One of the largest combinations of civil, environmental and geological engineering programs in Canada

Conrad Business, Entrepreneurship and Technology Centre

- » The centre's signature Master of Business Entrepreneurship and Technology program is the only offering of its kind in Canada focused entirely on entrepreneurship

Electrical and Computer Engineering

- » Third-largest electrical and computer engineering department in North America with 91 faculty members and 582 graduate students

Management Sciences

- » Offers Canada's only management engineering program, combining an engineering education with management skills

Mechanical and Mechatronics Engineering

- » Offers Canada's first full undergraduate mechatronics engineering program

Systems Design Engineering

- » Home to Waterloo Engineering's interdisciplinary biomedical engineering program

uniquely delivering the curriculum

Global Leader in Co-op Education

- » The University of Waterloo has the world's largest co-op program of its kind, with more than twice as many students as any other school in Canada
- » Co-op is a requirement for every undergraduate engineering student
- » Students rotate between academic terms and paid professional work terms
- » Engineering students finish their degrees with up to two years of work experience and often with a permanent offer of employment

Unique Co-op Jobs

In addition to working at external organizations during co-op terms, students have other options including:

Enterprise Co-op (E Co-op) Program

- » Participants receive ongoing support and mentorship while starting their own businesses

Bridging Entrepreneurs to Students (BETS) Program

- » Designed to help first-year co-op students develop transferable employment skills by pairing them with seed and early-stage startup companies

Research Co-op

- » Students gain valuable hands-on experience working alongside a researcher in a lab on or off campus



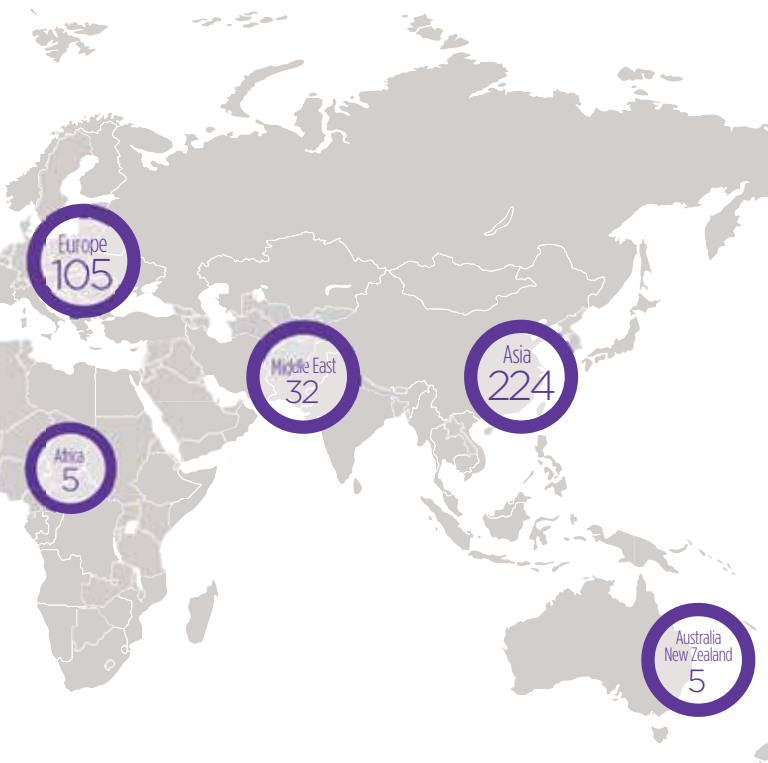
A management engineering student on a co-op term at Facebook Canada.

Top Companies That Hire Our Co-op Students

- » Apple Inc.
- » Bloomberg
- » Bombardier
- » EllisDon Construction
- » Facebook, Inc.
- » GM Canada
- » Google
- » Imperial Oil Limited
- » Microsoft
- » Open Text
- » PepsiCo Foods Canada
- » Shell Canada
- » Suncor Energy Inc
- » Twitter
- » The Hospital for Sick Children (Toronto)
- » Toyota Motor Manufacturing Canada Inc.



locations of
engineering co-op
positions in 2015



» TOTAL
8,091

Additional Ways We Uniquely Deliver the Curriculum

» Startup support

An entrepreneurial spirit infused in our culture has spurred the creation of international companies such as BlackBerry and Teledyne DALSA Inc. Programs and financial support offered throughout the University are instrumental in helping entrepreneurial students launch their startups. Our unique approach to intellectual property encourages students as well as our researchers to commercialize their discoveries and benefit from the profits.

» Enhanced experiential learning

By bridging the gap between knowledge and practice, experiential learning ideally prepares our students to address real challenges in new and creative ways.

Waterloo Cases in Design Engineering brings together the conceptual learning of the classroom with the real-world experience of a co-op term. Most of the cases are developed from Waterloo Engineering students' own experiences, including work term reports and design project reports.

Waterloo Engineering's new teaching innovation, the multi-disciplinary Engineering Ideas Clinic™, integrates classroom theory with hands-on learning as students design, build, test and refine ideas in a supportive environment.

» Student teams

Outside the classroom, students have many organizations and opportunities available to them, including a strong Engineering Society and the opportunity to join one of over 25 undergraduate design teams from the Midnight Sun Solar Car Team to the Concrete Canoe Team.

Many of the award-winning student teams are housed in the Sedra Student Design Centre, the largest facility of its kind in North America. Team members benefit from hands-on engineering experience, finding solutions to difficult technical problems and the opportunity to work alongside some of the best engineers in the industry.



The Sedra Student Design Centre consists of over 20,000 square feet of space dedicated to design teams and student projects.

Something is going on in Waterloo because the applications we get from Waterloo students are better than those we get from students of any other university.

— **PAUL GRAHAM**

Co-Founder, Y Combinator, January 2013

undergraduate studies

Waterloo Engineering offers 14 undergraduate programs: 13 professional engineering degrees, and one world-renowned architecture degree.

Undergraduate Students by Program in 2015

PROGRAM	TOTAL ENROLLED	WOMEN	INTER-NATIONAL VISA STUDENTS	DEGREES GRANTED
Architecture	364	218	12	69
Biomedical	92	54	4	*
Chemical	702	268	134	127
Civil	616	206	106	101
Computer	953	104	170	146
Electrical	673	107	130	160
Environmental	248	139	33	49
Geological	130	35	4	18
Management	287	119	39	53
Mechanical	1032	132	145	156
Mechatronics	748	104	77	116
Nanotechnology	480	108	40	98
Software	594	99	67	103
Systems Design	420	140	10	67
TOTAL	7,339	1,833	971	1,263

*First class to graduate in 2019



An environmental engineering student works on a research project.

Options include the Entrepreneurship Option in Engineering in which undergraduate engineering students explore course work and co-op terms in venture creation or corporate entrepreneurship to complement their engineering degrees.

Waterloo is probably the best up-and-coming startup city in the world The breadth of exposure to different sorts of engineering that you learn, the co-op program, and the way that there is just such a culture of thinking about problems in the world and ideas; ... it's really good.

— **SAM ALTMAN**

President, Y Combinator, November 2014



Working with industry, a multidisciplinary team is creating sensors to continually collect data to identify vulnerable municipal water pipes.

graduate studies

Waterloo Engineering's 37 graduate studies degrees include a wide array of master's and doctoral programs.

Degree Programs by Academic Unit

Architecture

- » Master of Architecture

Conrad Business, Entrepreneurship and Technology Centre

- » Master of Business, Entrepreneurship and Technology (MBET)

Chemical Engineering

- » Master of Engineering
- » Master of Applied Science
- » Doctor of Philosophy

Civil and Environmental Engineering

- » Master of Engineering
- » Master of Engineering (Nuclear Engineering)
- » Master of Applied Science
- » Doctor of Philosophy

Electrical and Computer Engineering

- » Master of Engineering
- » Master of Engineering (Electric Power Engineering)
- » Master of Applied Science
- » Doctor of Philosophy

Management Sciences

- » Master of Management Sciences
- » Master of Applied Science
- » Doctor of Philosophy

Mechanical and Mechatronics Engineering

- » Master of Engineering
- » Master of Applied Science
- » Doctor of Philosophy

Systems Design Engineering

- » Master of Engineering
- » Master of Applied Science
- » Doctor of Philosophy

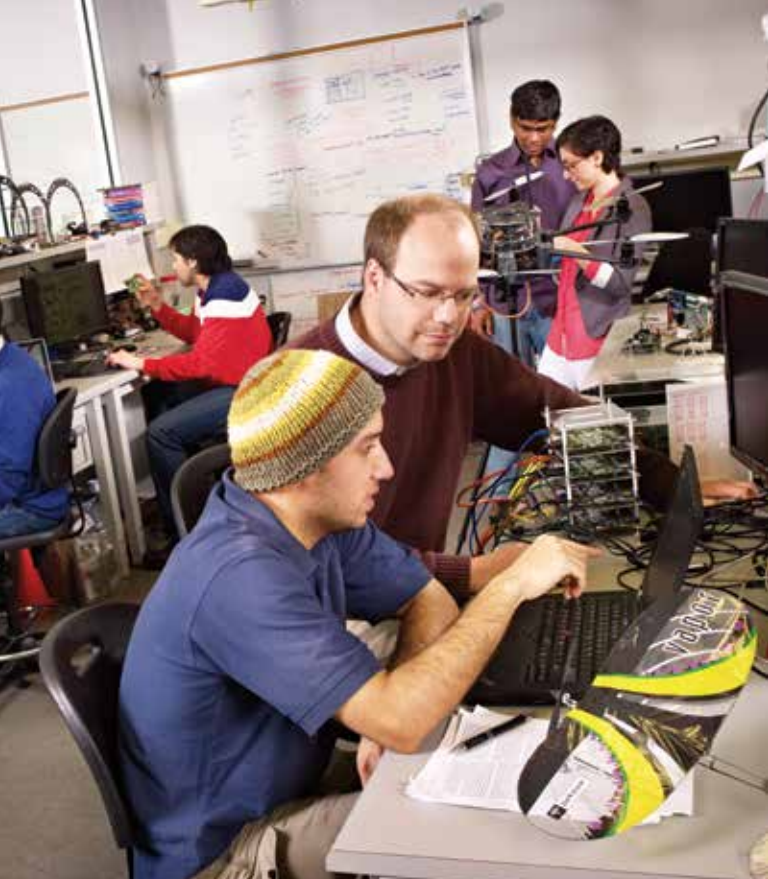
Collaborative research programs offered across faculties

- » Architecture offers a Master of Architecture degree in Water
- » Chemical engineering, and civil and environmental engineering offer Master of Applied Science and Doctor of Philosophy degrees in Water
- » Chemical engineering, electrical and computer engineering, mechanical and mechatronics engineering, and systems design engineering offer Master of Applied Science and Doctor of Philosophy degrees in Nanotechnology
- » Electrical and computer engineering offers a Master of Applied Science and Doctor of Philosophy degrees in Quantum Information

Graduate Students by Department in 2015

DEPARTMENT	MASTER'S STUDENTS ENROLLED	PHD STUDENTS ENROLLED	MASTER'S DEGREES GRANTED	PHD DEGREES GRANTED
Architecture	125	-	56	-
Conrad	33	-	42	-
Chemical	104	112	53	28
Civil and Environmental	109	126	42	26
Electrical and Computer	330	250	162	56
Management Sciences	108	29	77	5
Mechanical and Mechatronics	185	155	77	22
Systems Design	63	67	27	13
TOTAL	1,057	739	536	150

DEPARTMENT	WOMEN	INTERNATIONAL VISA STUDENTS
Architecture	73	9
Conrad	10	9
Chemical	63	126
Civil and Environmental	66	82
Electrical and Computer	116	319
Management Sciences	57	65
Mechanical and Mechatronics	46	134
Systems Design	34	74
TOTAL	465	818



Members of the University's Real-time Embedded Software Group collaborate on research.

The University of Waterloo is among the top few universities Google recruits from around the world.

— **STEVE WOODS**

Google's Canadian Director of Engineering, October 2013

Dual Degree Programs

Dual degree programs provide an opportunity to benefit from the advantages of a Waterloo Engineering doctoral program combined with that of another leading engineering school. Dual doctoral degrees (cotutelle) are issued when one doctoral dissertation is used to fulfil the requirements for a doctorate in two different universities in two different countries. Institutions the University of Waterloo has partnered with include Hong Kong University of Science and Technology, Université de Bordeaux, Utrecht, Pontificia Universidad Catolica de Chile and Sharif University of Technology.

Joint Degree Programs

With a joint academic program, students complete the first portion of studies at their home institution and the second portion at Waterloo. Depending on the program, students may also earn degrees from both institutions. Joint degree programs are offered to engineering students by institutions including South China University of Technology.

Funding and Awards

Waterloo Engineering offers competitive funding for our eligible graduate students. On average, in 2013/14 engineering students received the following:

- » Master of Applied Science (MAsc) \$25,000+
- » Doctor of Philosophy (PhD) \$35,000

Financial support is available from many sources including:

Waterloo Engineering

- » Graduate Research Studentships
- » Teaching Assistantships
- » Faculty of Engineering and Department Scholarships



Graduate students and researchers work in a chemical engineering lab.

Government agency fellowships and awards

- » Federal Tri-Council Scholarships
- » Ontario Graduate Scholarships

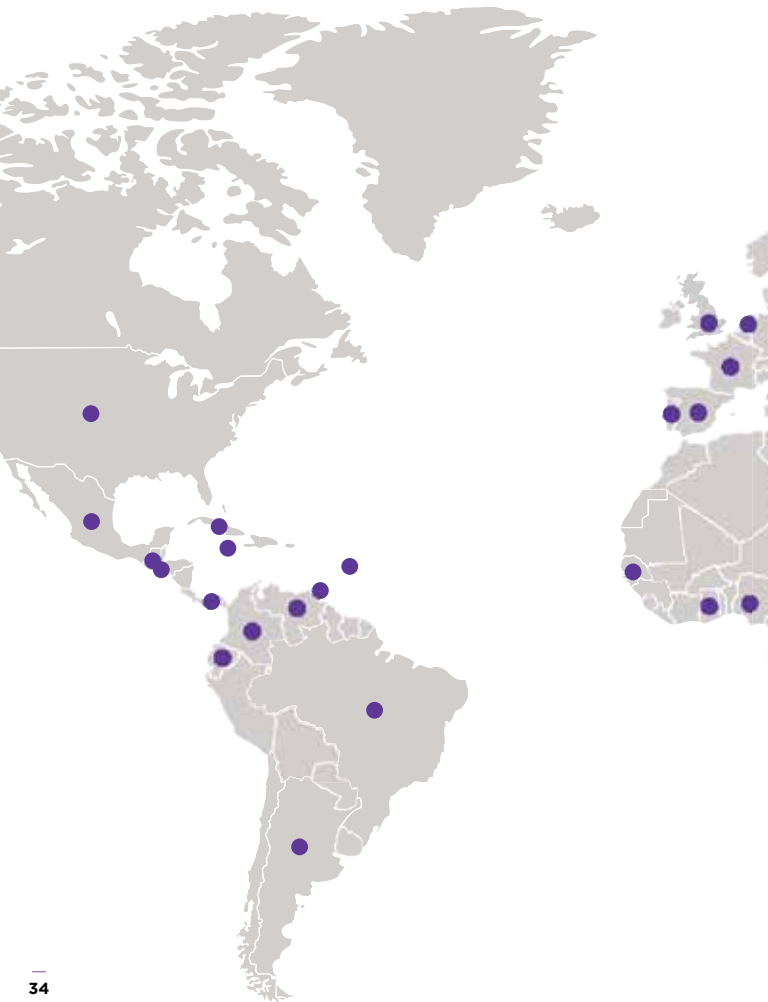
Loans, bursaries, and other assistance programs

- » Ontario Student Assistance Program (OSAP)
- » University of Waterloo Bursaries and Assistance

University of Waterloo awards

International Master's and Doctoral Student Awards (IMSA/IDSA)

international students



Every year Waterloo Engineering welcomes
top applicants from around the world. In 2015,

1,791

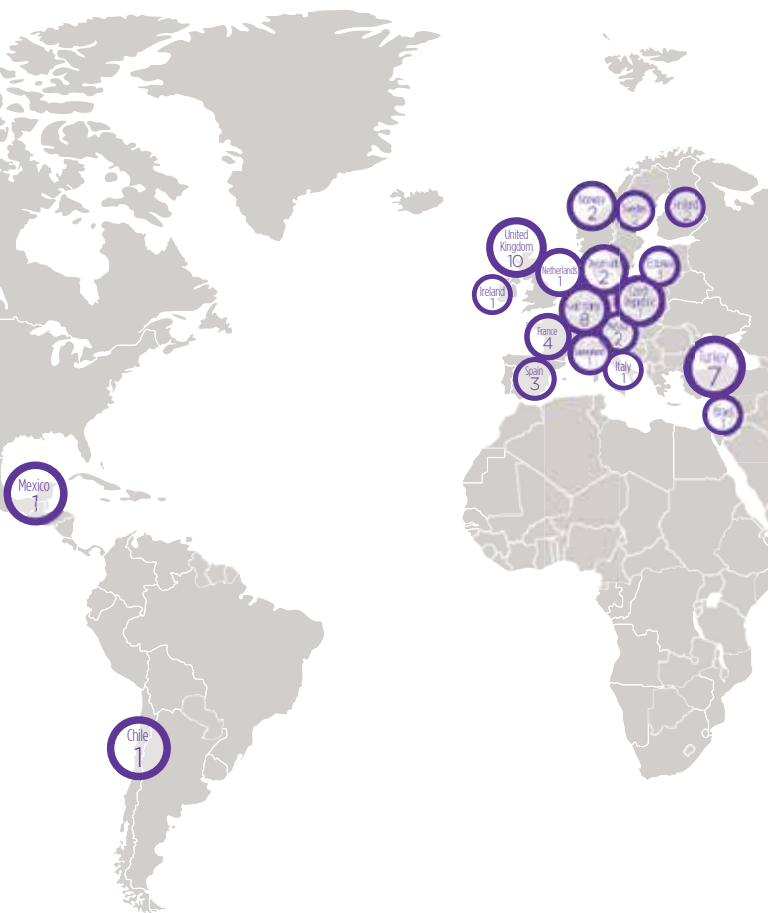
undergraduate and graduate
students represented over



70
countries



international exchange

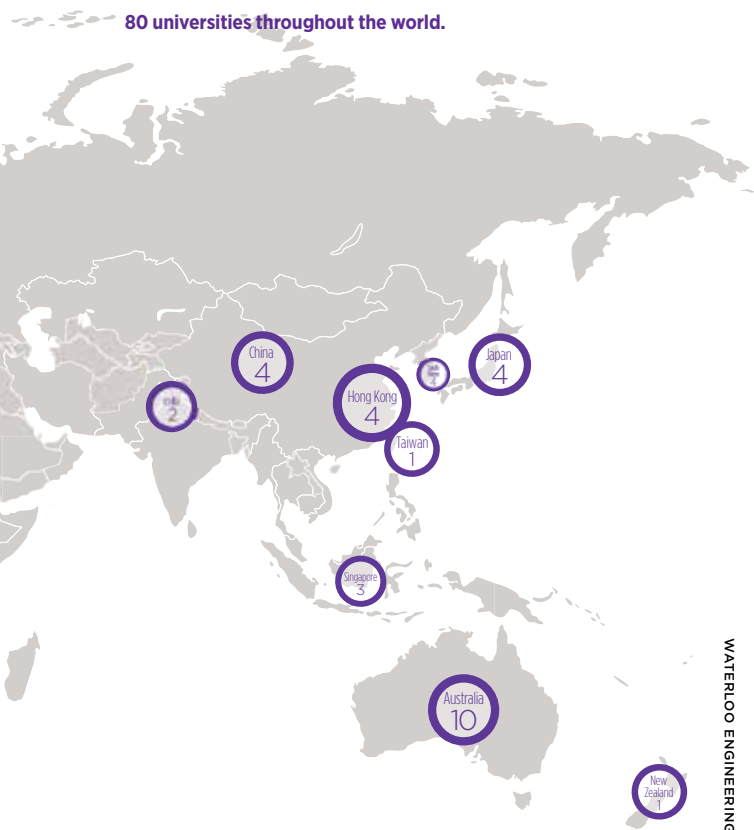


Waterloo Engineering fosters exchange opportunities in 28 countries around the world for its students and welcomes exchange students from international exchange partner institutions.

Participant advantages include:

- » Learning at other first-class institutions
- » Experiencing the cultures of other countries
- » Expanding technical and cultural knowledge
- » Improving linguistic skills

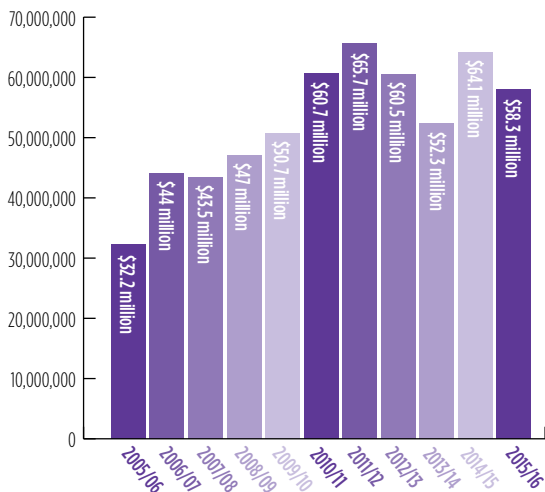
Waterloo Engineering partners with more than 80 universities throughout the world.



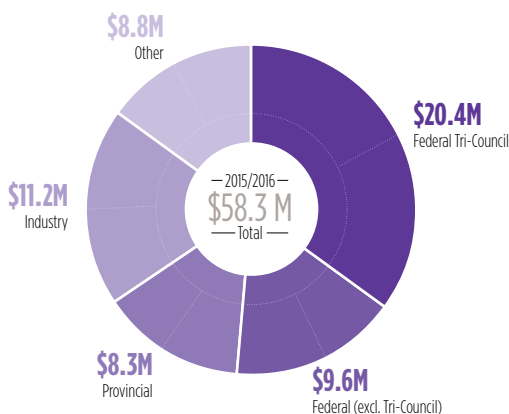
research and innovation

Clean energy, sustainable infrastructure, healthcare, additive manufacturing, wireless communications and nanotechnology are just a few of the areas in which Waterloo Engineering is advancing knowledge, powering economies and improving lives throughout the world. External research funding from Canadian and international partners is a strong indicator of the excellence of our research programs.

Research Funding Total by Year



Funding Distribution by Source 2015/2016



Government Funding Partners:

- » Natural Sciences and Engineering Research Council (NSERC)
- » Social Sciences and Humanities Research Council (SSHRC)
- » Canada Foundation for Innovation (CFI)
- » Canadian Institutes of Health Research (CIHR)
- » Mitacs
- » Defence Research and Development Canada (DRDC)
- » National Research Council (NRC)
- » Automotive Partnerships Canada (APC)
- » Federal Economic Development Agency for Southern Ontario (FedDev)
- » Canadian Council for the Arts
- » International Development Research Centre
- » Ministry of Transportation of Ontario (MTO)
- » Ontario Centres of Excellence (OCE)
- » Ontario Ministry of Research and Innovation (MRI)
- » Ontario Brain Institute
- » US Office of Naval Research (ONR)
- » Air Force Office of Scientific Research
- » US Army Research Office

Teaming Up with Industry

We are known for our industry partnerships, an orientation that leads to commercialization activities and numerous spin-off companies. Waterloo Engineering collaborates on research with close to 800 Canadian and 300 international companies. We have strategic research partnerships with leading global universities in over 30 countries around the world.

The Green and Intelligent Automotive (GAIA) Research Facility will help create a new breed of smarter, cleaner vehicles to revolutionize the automotive industry.



research chairs

Canada Research Chairs (Tier 1)

- » Carl Haas (Civil and Environmental Engineering)
CRC in Infrastructure Construction and Management
- » Amir Khajepour (Mechanical and Mechatronics Engineering)
CRC in Mechatronic Vehicle Systems
- » Amir Khandani (Electrical and Computer Engineering)
CRC in Wireless Systems
- » Raafat Mansour (Electrical and Computer Engineering)
CRC in Micro and Nano Integrated RF Systems
- » John McPhee (Systems Design Engineering) CRC in
Biomechatronic System Dynamics
- » Catherine Rosenberg (Electrical and Computer Engineering)
CRC in the Future Internet
- » Michael Worswick (Mechanical and Mechatronics Engineering)
CRC in Light Weight Materials under Extreme Deformation:
Forming and Impact
- » En-hui Yang (Electrical and Computer Engineering) CRC
in Information Theory and Multimedia Data Compression
- » Weihua Zhuang (Electrical and Computer Engineering)
CRC in Wireless Communication Networks

Canada Research Chairs (Tier 2)

- » Hossein Abouee Mehrizi (Management Sciences)
CRC in Health-Care Operations Management
- » Zhongwei Chen (Chemical Engineering)
CRC in Advanced Materials for Clean Energy
- » James Craig (Civil and Environmental Engineering)
CRC in Hydrologic Modelling and Analysis

- » Chris Eliasmith (Systems Design Engineering)
CRC in Theoretical Neuroscience
- » Ehab El-Saadany (Electrical and Computer Engineering) CRC in Energy Systems
- » Lukasz Golab (Management Sciences)
CRC in Data Analytics for Sustainability
- » Frank Gu (Chemical Engineering) CRC in
Advanced Targeted Delivery Systems
- » Sriram Narasimhan (Civil and Environmental Engineering) CRC in Smart Infrastructure
- » Carolyn Ren (Mechanical and Mechatronics Engineering)
CRC in Lab-on-a-Chip Technology
- » Alexander Wong (Systems Design Engineering)
CRC in Medical Imaging Systems
- » John Yeow (Systems Design Engineering)
CRC in Micro and NanoDevices

Endowed Chairs

- » Claudio Canizares (Electrical and Computer Engineering) Hydro One Research Chair
- » Sujeet Chaudhuri (Electrical and Computer Engineering)
Val O'Donovan Chair in RF/Microwaves and Photonics
- » Jatin Nathwani, (Civil and Environmental Engineering/
Management Sciences Engineering) Ontario Research
Chair in Public Policy and Sustainable Energy Management
- » Susan Tighe (Civil and Environmental Engineering)
Norman W. McLeod Chair Professor in Sustainable
Pavement Engineering
- » Zbig Wasilewski (Electrical and Computer Engineering)
Waterloo Institute for Nanotechnology

NSERC Industrial Research Chairs

Natural Sciences and Engineering Research Council of Canada (NSERC) Industrial Research Chairs are funded jointly by NSERC and industry.

- » Adrian Gerlich (Mechanical and Mechatronics Engineering)
NSERC/TransCanada IRC in Welding for Energy Infrastructure
Associate Industrial Research
- » Peter Huck (Civil and Environmental Engineering) NSERC IRC
in Water Treatment
- » Amir Khandani (Electrical and Computer Engineering) NSERC
Ciena IRC in Advanced Telecommunications Technologies
- » Mahesh Pandey (Civil and Environmental Engineering)
NSERC IRC in Management of Engineering Systems
- » Safieddin Safavi-Naeini (Electrical and Computer Engineering)
NSERC C-COM IRC in Intelligent Antenna and Radio Systems
for Next-Generation Millimetre-Wave Mobile Communications

Industry Sponsored Chair

- » Kaan Inal (Mechanical and Mechatronics Engineering)
GM Canada Research Chair in Multiscale Materials Modeling

University Research Chairs

The University of Waterloo recognizes exceptional achievement and pre-eminence in a particular field of knowledge through the designation of University Research Chair.

- » Pu Chen, Chemical Engineering
- » Duane Cronin, Mechanical and Mechatronics Engineering
- » Richard Culham, Mechanical and Mechatronics Engineering
- » Xianshe Feng, Chemical Engineering
- » Shesha Jayaram, Electrical and Computer Engineering
- » Fakhreddine Karray, Electrical and Computer Engineering
- » Xianguo Li, Mechanical and Mechatronics Engineering
- » John Long, Electrical and Computer Engineering
- » Mark Matzen, Chemical Engineering
- » Ravi Mazumdar, Electrical and Computer Engineering
- » Michael Tam, Chemical Engineering
- » Ehsan Toyserkani, Mechanical and Mechatronics Engineering
- » Norman Zhou, Mechanical and Mechatronics Engineering

Research Awards and Distinctions

Waterloo Engineering is proud of achievements by current and former faculty members who have been recognized by the Governor General of Canada and prestigious organizations.

- » Order of Canada: **3**
- » Canadian Academy of Engineering Fellows: **34**
- » Engineering Institute of Canada Fellows: **15**
- » Royal Society of Canada Fellows: **17**

Areas of Research Expertise

Faculty members are focusing on the following emerging/disruptive technologies that will transform life, business and the global economy:

Advanced Manufacturing

- » Additive manufacturing
- » Advanced robotics
- » Controls and precision tooling
- » Digital factories

Architecture and Design

- » Digital design and fabrication technologies
- » Environmental issues and new material economies
- » Globalization
- » Urbanization

Automotive and Intelligent Transportation Systems

- » Alternative fuels
- » Autonomous vehicles
- » Connected cars
- » Hybrid and electric vehicles
- » Lightweight materials
- » Structural crashworthiness
- » Transportation networks

Bioengineering and Biotechnology

- » Bio-compatibility and in-vitro modelling
- » Human movement
- » Human factors (ergonomics)
- » Image processing and data analytics
- » Medical imaging
- » Scanning
- » Wearable technology

Energy and Infrastructure

- » Energy harvesting/bio-energy
- » Energy storage
- » Power systems
- » Renewable energy
- » Smart buildings
- » Smart communities

Information and Communications Technology

- » Big data and artificial intelligence
- » Cloud technology
- » Cybersecurity
- » Embedded systems
- » Internet of Things
- » Information systems
- » Sensors and devices
- » Machine learning
- » Wireless communications/networking

Nanotechnology

- » Nano-biosystems
- » Nano-electronics
- » Nano-instrumentation
- » Nano-materials

Water and Environment

- » Drinking water
- » Value-added recovery
- » Waste water management

Research Centres

Engineering researchers foster partnerships and produce extraordinary research findings in strategic areas through the following University Research Centres and Institutes:

- » Centre for Advanced Materials Joining
- » Centre for Advancement of Trenchless Technologies
- » Centre for Bioengineering and Biotechnology
- » Centre for Control of Emerging Contaminants
- » Centre for Intelligent Antenna and Radio Systems
- » Centre for Pattern Analysis and Machine Intelligence
- » Centre for Pavement and Transportation Technology
- » Games Institute
- » Giga-to-Nano Electronics
- » Institute for Computer Research
- » Institute for Innovation Research
- » Institute for Polymer Research
- » Institute for Quantum Computing
- » Water Institute
- » Waterloo Centre for Automotive Research
- » Waterloo Centre for Groundwater Research
- » Waterloo Institute for Nanotechnology
- » Waterloo Institute for Sustainable Energy



Research in tracking technology at the Waterloo Autonomous Vehicles Laboratory will open up new possibilities for aerial and ground autonomous vehicles.

“Engineers advance the economy in a very simple metric. They create companies. Many of those companies are very successful. They provide all the things that we cherish in Canada ... That’s why I think it’s so important that Waterloo is successful. You can’t have a competitive society without a really good cohort of engineers graduating from it every year.”

— **KEVIN O’LEARY**

Investor on ABC’s Shark Tank, March 2015

women in engineering

Waterloo Engineering has one of the highest percentages of women in undergraduate programs in Canada. In 2015, women accounted for 28.1 per cent of first-year students and 23.2 per cent of all engineering undergraduates.

The Faculty's Women in Engineering (WiE) committee encourages the next generation of women to pursue careers in engineering and supports current women faculty members and students. WiE hosts a variety of programs and partnerships at the elementary, secondary and post-secondary levels that are tailored to the needs of their audiences. Hands-on activities and inspiring mentors demonstrate to young girls that engineering is about developing creative solutions that enhance everyday life.

At the university level, WiE facilitates networking, mentoring, and professional development opportunities for Waterloo Engineering students and alumni, fostering a sense of community and helping them to navigate their education and careers.



Women in Engineering Outreach events engage young girls in engineering by igniting their interest in discovery and invention.

There is an undeniable reputation throughout tech of the kind of engineering talent that comes out of the University of Waterloo. The students here are probably going to be the business leaders of this century.

— **ALEXIS OHANIAN**

Co-Founder, Reddit, December 2013

entrepreneurial ecosystem

The University's unique culture, which embraces collaboration, creativity and risk-taking, has cultivated some of Canada's youngest and most successful entrepreneurs. Over 600 companies have been launched by Waterloo Engineering students, faculty members and alumni.

Multiple programs, resources and other types of support throughout Waterloo Engineering and the University of Waterloo help engineering students develop and launch their products and businesses.

These include:

Engineering Student Capstone Design Projects

- » Senior-year engineering projects that challenge students to conceptualize and design a real-world product or service. Ground-breaking ideas leading to the creation of Athos, Intellijoint HIP, the Myo armband and the Pebble smartwatch had their geneses in the Capstone Design program.
- » The Faculty, working with industry partners and private sector donors, provides extensive financial support and industry mentorship to advance entrepreneurial student projects.

Engineer of the Future Fund

- » Created to financially assist Waterloo Engineering innovators and entrepreneurs during the critical startup phase. Used to fund student initiatives such as Capstone Design projects and student teams.

Conrad Business, Entrepreneurship and Technology Centre

- » Part of Waterloo Engineering, the Conrad Centre advances the state of entrepreneurship education, research and executive development in Canada.

Velocity

- » A University-wide program, Velocity has partnered with tech giant Google and the industry-led innovation centre Communitech to become North America's largest free business incubator. \$250 million has been raised by Velocity-supported companies — including \$150 million by engineering startups since 2014.

Waterloo Commercialization Office (WatCo)

- » Offers commercialization services and expertise to turn research findings into commercially viable products and services.

Intellectual Property Policy

- » The University's "creator-own" Intellectual Property (IP) Rights Policy cultivates an entrepreneurial environment that drives innovations from the lab to the marketplace. The policy is instrumental in positioning Waterloo as a national leader in the transfer of ideas and technology to the private sector.

Hack the North

- » Held annually on campus with Waterloo Engineering as the principle partner, Canada's largest international hackathon attracts over 1,000 students and executives from a number of the world's best tech companies who act as judges. It's just one of many student-led initiatives that demonstrate the inventiveness and leadership skills of our talented students.

Local Entrepreneurial Expertise

- » The University is at the heart of the dynamic innovation ecosystem in the Waterloo region that includes the David Johnston Research + Technology Park, the Accelerator Centre and Communitech Hub incubators, and the Perimeter Institute for Theoretical Physics and Centre for International Governance Innovation think tanks.



Systems Design Engineering alumnus Lyon Wong founded Spectrum 28, a Silicon Valley-based early-stage venture capital firm.

Spectrum 28 Student Venture Program

Launched in June 2016, a partnership between Waterloo Engineering and Spectrum 28, a Silicon Valley venture capital firm founded by alumnus Lyon Wong (Systems Design Engineering '03), will support entrepreneurial engineering undergraduate and graduate student ventures, providing mentoring, resources and access to a \$2-million venture capital equity fund.

strong startup culture

600+ STARTUPS

At last count, Waterloo Engineering's students, faculty, staff and alumni had founded over 600 individual companies that are shaping the future of engineering and technology. They include:

0-9

2G Robotics
360 Incentives
360pi
4iiii Innovations
724 Solutions

A

A Thinking Ape Technologies
Abatis Systems
Acumetrics Business Intelligence Inc.
AdFlavour
Advanced Scientific Computing
Advantage Engineering
AEMK Systems Inc.
Aeryon Labs Inc.
Aggregate Knowledge
AHBM Systems Inc.
AHU Innovations Ltd.
Airo (Blacktree Health)
Akina
alchemii
Alert Labs
Algo Anywhere
Alirus
Alkemi Labs
Aloxsys
Amitel
Analysis Works
AngleMedia

Angstrom Power Inc.
Anikolab
Ansik
Antelope
Anue Systems
AOMS Technologies
Apartment Research
Applied Brain Research
Arbutus Technologies Inc.
Architech Microsystems
Arius Software
ARTsensing Inc
Arvossa
asianrice.tv
Aspen Solar Management Inc.
Astute Networks
Aterica
Athos
AtlasTrax
Aurora International Telecommunications
Auvik
Avantel Consulting Inc
Avidbots
Avvasi
Axiom Mobile Imaging

B

B2Gold Corp.
Babensee Controls Engineering

Babylon VR
Ball Labs
Balute
Bankers Petroleum Ltd.
Bartesian
Baylis Medical Company Inc.
Benbria
Bering Media
BG Games
BicDroid
Binary Tattoo
BioEndeavor
BioFont Inc
Bioinformatics Solutions
Biorem
Bipsim Inc
bitSIM.co
BlackBerry (Research in Motion)
Bladetech Hockey Inc.
Blend Labs
Blitzen (Marmot Labs)
Bluefin Labs
Boltmade
Braun Consulting Engineers Ltd
Bridgescale Partners
Brykman Developments Inc.
BufferBox
Building Rapport
Byte Craft Ltd
Byzantium Tech Ltd.

C

C3 Group
 CAMplete Solutions Inc.
 Canadian Posture
 and Seating Centre
 Canadian V-Chip
 Design, Inc.
 Canvas Labs
 Cardinal Financial
 Advisors
 Careerify
 Carona Designs Inc.
 Cast ConneX
 Corporation
 Cayo Systems Inc.
 Cbeyond, Inc.
 CellScale
 CertClean
 Certicom
 Chalk.com (Planboard)
 Channel Portal
 Chapman Software
 Design Incorporated
 Char Technologies
 ChargeSpot
 Chatroll
 CHAYA
 Cherrypicks
 Chic.media
 CiRBA Inc.
 Circumference
 Technology
 Services Inc.
 Cistel Technology Inc
 Clarmedia
 Clearpath Robotics Inc.
 CliftonGroup
 International
 Clothera
 Code Connect
 Cognitive Spark Games
 Coins-e
 CommonOffice.com
 Comptrol Computer
 Control Incorporated
 Conavi Medical Inc.
 Concord
 Conekta
 Connect Tech
 Incorporated
 Cookie Jar
 Coop Interview
 Corman Technologies
 Incorporated

Cortex Design Inc.
 Counter Intuitive
 Couple (Maide Inc.)
 Coursolve
 Creekside
 Communications
 CREZ Basketball
 Systems
 Crouton Labs
 (Exquisine)
 Crowdriff
 Crystal Decisions
 CTO Sydus Pte Ltd.
 Curry Hydrocarbons
 CVF Technologies
 Corporation
 cVision Medical
 Solutions
 Cyberaxiom

D

D.B.M. Systems Inc.
 D.G Henderson &
 Associates Ltd
 Dakemi
 Communications
 DALSA
 Dantec Systems
 Corporation
 Data Deposit Box
 DataTellIt Inc.
 Datifex
 DDE Medi
 Deeth Williams
 Wall LLP
 Dekalam Hire
 Learning Inc.
 (PolicePrep)
 Design 1st
 Desire2Learn
 Deskribed
 Digital Extremes
 Diochem
 Corporation
 diPoll
 Doppel
 DossierView
 Double Take
 draftingSPACE
 Dreamcube
 Dunsire
 Developments Inc.
 Dynajoin Corporation
 Dynastream

E

E La Carte
 Earthscape Creative
 Landscapes
 Eat2Feed
 Eatlime Inc.
 Eco Place Organics
 Ecologix
 EcoRio
 Edgebotix
 efabless.com
 Emforium Group
 EMJ Data Systems Ltd
 Energate
 Energent Inc.
 Enermodal
 Engineering Ltd.
 Enervac Corporation
 Engineers Without
 Borders
 Entact Robotics Inc.
 EnviroMetal
 Technologies
 Epik Networks
 Eserro Inc.
 Ethoca
 Eurodata
 eValueInsight
 Eve Tab
 Ex Vivo Technologies
 Exact Media
 Networks Inc.
 ExecVis Spotlight
 Exhibit.in
 Extreme Venture Labs
 Extreme Venture
 Partners
 EyeCheck

F

Fakespace Labs, Inc.
 Farsightech Inc
 Fastback Networks
 Fastbite
 Finesse
 Firmwater Inc.
 Five Pumpkins LLC
 Fixmo Inc.
 Flarion Technologies
 FleetCarma
 (CrossChasm)
 Fleming Systems
 corporation
 Flinja
 Flipp (Wishabi Inc.)

Fluent Engineering Inc.
Fotofox
Fresco Microchip
Fullerton, Sherwood
Engineering Ltd
Fundica.com
Fuzo Ltd.

G

Gallop Labs
Genesis Advisers LLC
Gest-Sure
Get It Pty Ltd.
GHD (Conestoga-
Rovers & Associates
Limited)
Glowe Consulting
Services
GO DSP
GoFastCab
GoingAnyway
Goosechase
Gotya
Grascan
Construction Ltd.
Grayscale Coatings
Green Brick Labs
GreenLine Partners
Greenworx
Gren Weis Architect
& Associates
Grobo
Group Effect
Growple
Growth Mosaic

H

Hackademy Canada
Handshake VR
Harvan
Engineering Ltd.
Hastings, Boulding
and Correia
Heartwood
Hedgehog Products
HiMama
Hockey Robotics
Hover Labs
Hydrated World
Hydroform
Expertise Group
hyperPad

I

i2iQ Inc.
Ice Biotech

Idimoris (Synekism)
iDreambooks
iExperienceit
Ignis
Imaggle
Imara Research
Imbue
Immediate Mobile
Imply
IndiGo
Indigo
Technologies Ltd.
Influenza Media
Innopage
Innovate Advisory Inc.
Inoventive
InScene Systems
Inspire
Instacart
Instaread
instream
Integrated Circuit
Scanning
Probe Instruments
Intelligent Mechatronic
Systems
Intellijoint Surgical
(Avenir Medical Inc.)
Intelwaves
Technologies
Interactive SoftwareInc
InterGlobal Solutions
InterGlobe
International
telepresence
Invuze
Ionic Engineering
Limited
Isee3D Inc.
ITRES Research Ltd

J

J.E. Boritz
Consultants Ltd
JADE Engineers Inc.
Janna Systems
Jingu Apps
JoLi Cosmetics
Juntogroup
Professional
Consultants

K

Kemex
Kerixa

KFL Investment
Management Inc.
Kiina Group
Kik Interactive
Kitematic
KiwiWearables
Knapkins
Knowledgehook
Knudsen
Engineering Ltd
Kofman Engineering Ltd
Korner
Kornersafe
KruzITech
Kue
Kue Software Inc.
KYM4

L

L. Forrest
Mechanical Inc
labforge
Lakes Environmental
Consultants Inc.
Lani
Learn hub
Lectorius
Legal Reach
Lime Events
Loose Button Inc.
Lowe, Gravelle &
Associates
Lumotune
Lyft
Lystek International Inc

M

M&M Food Market
(M&M Meat Shops
Limited)
MagClip
Magellan Angel
Partners
Maieutic
Majik Systems
Maluuba
Maplesoft
MappedIn
Marketing on Demand
Mattermost
McKnight's
Flowershoppe Inc.
MDT Engineering
Medella Health
Mediaspot.me

Medium One
 MEDL Technology Corp
 MENA Geothermal
 Mesh Equity
 Meshlytics
 MetaConcepts
 MetaLux
 MetricWire
 Meya.ai
 Mind Reef
 MindR
 Miovision Technologies Inc.
 Moment.Us
 MoneyKey
 Monstercat Media Group
 Morning Owl
 MU Patents (Engfield Patents and Trademarks)
 Multiculture Bevco Inc.
 Mustang Capital Partners
 mWater
 MWisdom
 MXI Technologies Limited
 My Top Fans
 MyLocal
 Mythoja Consulting Inc.

N

Nanodrivers
 NanoQuan Inc.
 Navcast Inc.
 NERv
 Netskope
 Neverfrost
 NexJ Systems Inc.
 Next Page
 Nicoya Lifesciences
 nModus
 Notewagon
 Nova Inc.
 NowTen
 nTerop Corporation
 Nulogy Corporation
 Nuvation Engineering
 Nuvation Research
 Nuvyyo Inc.

O

OctigaBay Systems
 Oculis Labs
 Offertunity
 Ohzone
 Oikoi
 Omisa Inc. (Segasist Technologies)
 OnCampus Mapping
 OneSet
 OneSpout
 OnLatte
 Only Growth
 Oopsmark
 Open Options Corporation
 Open Portal
 Optiac Solutions Inc.
 OrganoWorld
 Origin
 OverStats

P

PagerDuty
 Palette
 PalGrid
 Paragon Engineering Ltd
 Partnerpedia Solutions Inc.
 Pastel Dress Party
 Pathway Intelligence
 Pattern Discovery Technologies Inc.
 Pavement Management Systems
 PBJ Studios
 PC Automation (Geoware)
 Pebble
 Peibly Inc.
 Peeta Consultants
 Peoplecount
 Perch
 Perfect Bonus
 Perpetua Labs
 Pervasive Dynamics Inc.
 PetroPredict
 Picarro
 PiinPoint
 PinPress
 Pixineers Inc.
 PixStream

PlanLeaf
 Playfit Health Inc
 PNO Management Consultants
 PointerWare Innovations Ltd.
 Polar Mobile Group Inc.
 Poliplus Software
 PolyGaze
 Ponder
 PopHire
 PostRank
 Pout
 Practicure
 Precidia Technologies Inc.
 Precipo
 Priiva Consulting Corporation
 Prinova Technologies Inc.

Priority One Data
 Prodigy Game
 ProductWiki
 Project Graphics
 Purple Forge
 PUSH Design Solutions Inc
 Pymetrics
 Pyxis Adler Technology Solutions Inc.

Q

Qidni Labs
 Qtech Hybrid Systems
 Quadzilla Racing

R

R&D Partners
 Rad3 Communications
 RainboSolar
 Raise the Brain
 Ranovus
 Rapid Laboratory Microsystems Inc.
 Rapid Mind (Intel)
 RAW Design
 rbonut
 Realmealz
 Real-Time Engineering Simulation
 Reccit
 Reden Labs

Redknee Solutions
Reebec
reelyActive
Reflexion Medical
Renewability
Revel (The Madison
Group)
Revsolutions Inc.
RewardCat
Rich Internet Group
Richard Dray
Engineering
RideCo
Robinson
Consultants Inc.
Rocket Launch
Marketing
Rocky Creek Winery
Ross Video
rr Chocolats
Rush Hydraulic
Pneumatic
Rushing Tide Media
RVTR

S

S.DG Design
Sage Design
SALT Technology
Sandvine Inc.
Savvica
SayGo Solutions
Schoolax
Sciometric
Instruments Inc.
SciGit
Scott Construction
Limited
SeaWell Networks Inc.
Second Funnel
Second Wave Games
Seeq Corporation
Sendex
Environmental
Corp.
Sentinelle Medical Inc.
Sentry Scientific Inc.
Sequoia Oil & Gas
Trust
Serdek Automated
Systems
Sesame
SharedBy.co
SharePoint Delivery
Ship Time Inc.
Shoebox
Shogi Group
ShufflePix
Shutterous
Siborg Systems Inc
Sidercar.me
Simply Good
Technologies
Singspiel Inc
Sinuwave
Technologies
Sirific Wireless
Corporation
SITE8
Technologies Inc.
SiWorks
Skimble
Skyline Sector 5
Skyline Sector 5
Digital
Slade Engineering
Systems Ltd
SlipStream
Small Ideas
Smarter Alloys
Snowball
Social Capital
Partnership
SocialDeck
SocialNav Inc.
Solares Architecture
SolarTab
Solink
Sortable
SoThree
SparkGig
SparkMatrix
Technologies Inc.
Spatial Vision Group
Spectronic Plating
Corporation
Spectrum 28
SpinPunch Inc.
SportsChimp
Spotivate
Springbot
Squarify
SSIMWave Inc.
Stealth
StockMarketStudent
Storm8
Strata
Streak
Strike Face
Technologies
Structur3D Printing
Suncayr

Sweet Tooth Inc.
Sybarus Technologies
Synaptive Medical
SZE Straka Engineers

T

Taab
Tactile Sight Inc
Taiwan Connection
TalentLab
Taly Mind Set
Tangam Systems
TapTrack
TaraSpan Group
Targetivity
TCA Technologies Inc.
TDS Dixon Inc
TeaBOT
Tech Capital Partners
Telly
Tersano Inc.
TeTechS Inc
TextNow (Enflick)
Thalamic Labs
The Acorn
Assignment
The Black Box
Institute
The Blueprint
Growth Institute
The Jack Project
The New Energy Group
The Rope Store
The Shared Web
The Shop Society
They Innovate Inc.
Thinkfree.ly
ThinkRF
Ticker
TimeStep Corp
TJS Technical Services
TMIG | The Municipal
Infrastructure
Group Ltd.
Togethr
Top Foil P.L.C.
Top Hat
Total Rail Analysis
Corporation
TransGaming
Technologies Inc.
TravelGator
TrendRadius
TribeHR
Trigger Resources
Limited

Triple H Construction
Tripzaar
Trisura
TritonWear
Trivaris Ltd.
TRK Engineering Ltd.
True&Co
Trusted Positioning
Tulip Retail
Tungle Corporation
Tutor Bright
TwitSprout
TwitVid
Two Mangoes
Tyromer Inc.

U

Ubiq
uForis VR
Unbounds
Unlockly
Up in Front
Upverter

V

Varden Labs
VCi Green Funds
Verticle

Vestec
VideoLocus
Vidyad
Virtual Button
Technologies
Virtual Materials
Group, Inc.
Visibli
VistaShift
Vitameter
Vizible Corporation
Volker-Craig
Technologies Ltd
Voltera Inc.

W

Waterline Group
Waterloo Biofilter
Systems Inc
Waterloo Engineering
Software
Waterloo Groundwater
Control Technologies
Watlan
WatrHub
Wattpad
Well.ca
wellofchange.org

West Side Labs
Wiebe Engineering
Group Inc
WiFiSLAM
Willis Energy Services
Willstream
WiseUncle Inc.
WIZ Communications
Woozilli
WordStream
Worldview Technology
Partners
Wriber Inc.

X

XCG Consultants Ltd.

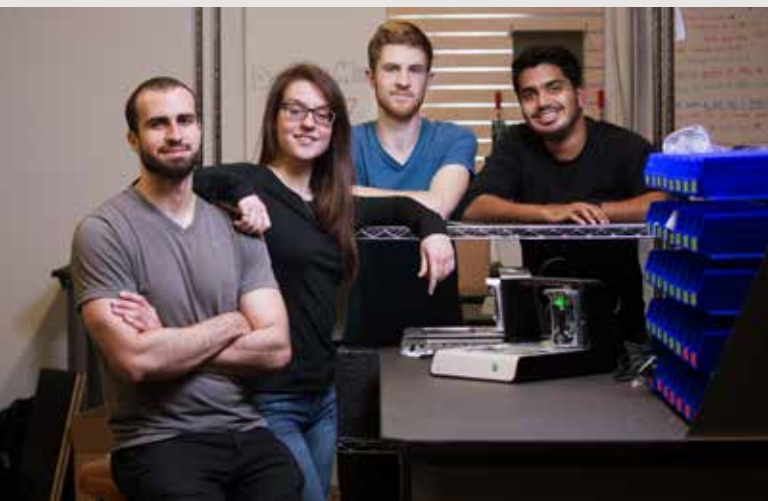
Y

Yaletown Venture
Partners
YES.TAP

Z

Zebroski Associates Ltd
Architects
Zenreach
ZeroFootprint Inc.

Voltera Inc., now a successful startup, began as an Engineering Capstone Design project. The company won the prestigious 2015 James Dyson Award, the first Canadian startup to capture the honour.



engineering outreach programs

For over 25 years, Waterloo Engineering's Outreach department has worked to promote a better understanding of the impact the STEM fields (science, technology, engineering and math) have on the lives of Canadians and others.

Programs include:

Engineering Science Quest (ESQ)

Since 1990, ESQ has empowered elementary-aged youth by instilling confidence in their science, technology, engineering and math abilities. By engaging students through hands-on activities offered in a fun and energetic environment, ESQ fosters an understanding of the technological world.

Every year, ESQ offers over 300 activities delivered across 15 day camp programs. These activities range from Grade 3 and 4 campers building their own Morse code to Grade 7 and 8 students disassembling a snowblower engine.

Summer camps are offered at the main campus, as well as in smaller communities and aboriginal locations across Southwestern Ontario. Outside of the summer, ESQ holds school break programs and in-class elementary workshops.

ESQ, a member of Actua, a national network of STEM education programs, was awarded the 2013 Actua and GE Canada Award for Leadership and Innovation in science and technology education.



The Outreach department promotes the STEM fields — science, technology, engineering and math.

Catalyst

Outreach's Catalyst program engages high school students interested in the world of science and engineering. Catalyst's Women in Engineering conference for Grade 11 students encourages young women to pursue careers in technological fields. Participants stay in a university residence and are introduced to the many facets of science, technology, engineering and math at a post-secondary level.

Other Initiatives

The Outreach department supports many other activities such as the Waterloo Electric Vehicle Challenge. The annual endurance competition encourages high school students to design, build, and test their own electric cars.

Waterloo Engineering plays host to FIRST LEGO League and FIRST Robotics regional and provincial competitions. Both programs inspire young people to pursue further studies and careers in the fields of science, technology and engineering.

notable alumni

The following alumni have been honoured with the Faculty's Alumni Achievement Medal, the highest award Waterloo Engineering bestows on its graduates. Recipients are listed along with the positions held at the time they were honoured.

2015 Medal Recipients

- » Clearpath Robotics Inc.: Ryan Gariepy, Patrick W. Martinson, Matt Rendall and Bryan Webb, co-founders of Clearpath Robotics Inc.
- » Marc H. Morin, CEO of Auvik Networks Inc.
- » Brent E. Tweddle, Guidance and Control Engineer at the NASA Jet Propulsion Laboratory
- » Fangjin Yang, Co-founder and CEO of ImPLY

2014 Medal Recipients

- » Khaled Al Sabawi, Founder and President of MENA Geothermal
- » Baylis Medical: Kris Shah, EVP and CTO, and Frank Baylis, President
- » B. Alison Brooks, Founder/Director of Alison Brooks Architects Ltd.
- » Mohammed Y. Chisti, Professor at School of Engineering and Advanced Technology, Massey University

2013 Medal Recipients

- » Andrew J. Clinton, Senior Software Developer at Side Effects Software
- » Lynnette D. Madsen, Program Director of Ceramics for National Science Foundation (NSF)
- » Sony (Waterloo office): Steve Brenneman, Anton (Tony) Jedlovsky and Brian Orr, co-founders of the Waterloo office



Clearpath Robotics founders Patrick Martinson, Matt Rendall, Ryan Gariepy and Bryan Webb.

2012 Medal Recipients

- » Reza Chaji, VP of Technology, IGNIS Innovations Inc.
- » Ilia Kaufman, President and CEO of Kaufman Consulting Services Ltd. (KCSL)
- » PLANT Architect Inc.: Chris Pommer, Lisa Rapoport and Mary Tremain, partners of PLANT Architect Inc.
- » Michael D. Watkins, Chairman/Adjunct Professor of Genesis Advisers/IMD

2011 Medal Recipients

- » Sheldon Fernandez, Co-founder and Director of Infusion
- » Stephan F. Matusch, Founder and President of Ionic Engineering Ltd.
- » Kurtis N. McBride, Co-founder and CEO of Miovision Technologies Inc.
- » Shim-Sutcliffe Architects: Brigitte Shim and Howard Sutcliffe, co-founders of company
- » Nityanand Varma, President and CEO of ANASA Group Inc.

2010 Medal Recipients

- » John A. Baker, President and CEO of Desire2Learn
- » Bruce Bodden, President and CEO of MMM Group Ltd.
- » Juan-Carlos de Oliveira, Co-founder of Cast Connex Corporation
- » Frederick R. Grigsby, Senior Vice-President of Information Technology at CN (recently retired)
- » Kevin J. Negus, General Partner with Camp Ventures
- » George H. Newton, Consultant

2009 Medal Recipients

- » Engineers Without Borders: George Roter and Parker Mitchell, co-founders of Engineers Without Borders
- » Shelagh McCartney, Adjunct Professor at the School of Architecture, University of Waterloo
- » Cameron A. Piron, President and Co-founder of Sentinelle Medical Incorporated
- » Kevin Salvadori, Executive Vice-President of Business Transformation and Technology Operations at Telus Corporation
- » Alim A. Somani, President of Infusion Development
- » Gerald R. Sullivan, Chairman of the Board of Energent Incorporated

2008 Medal Recipients

- » Hadi-Khan Mahabadi, Vice-President and Director of Xerox Research Centre of Canada
- » John Saabas, Executive Vice-President of Pratt and Whitney Canada

2007 Medal Recipients

- » Camp 15, Waterloo, Kipling Ritual Wardens
- » Ron S. Dembo, Founder and CEO of Zerofootprint
- » Donald J. Noakes, Professor and Dean of Statistics and Mathematics, School of Advanced Technologies and Mathematics, Thompson Rivers University
- » Claire J. Tomlin, Associate Professor in the EECS Department at Berkeley, University of California at Berkeley



Don Walker, Chief Executive Officer, Magna International Inc.

2006 Medal Recipients

- » Stephen Burns, President of B.M. Ross and Associates Ltd.
- » Oyewusi Ibidapo-Obe, Vice-Chancellor of the University of Lagos (UNILAG) Nigeria
- » Vivienne Ojala, President and CEO of Brock Solutions

2005 Medal Recipients

- » Catherine A. Booth, Vice-President of Information Technology for Canadian Tire Corporation's Retail Division
- » John M. Seminerio, Managing Partner of Magellan Angel Partners

2004 Medal Recipients

- » Stephen C. Carpenter, President of Enermodal Engineering Limited
- » Terence C. Cunningham, Vice-President Corporate Development of NGRAIN Corporation
- » Robert B. Magee, President and CEO of the Woodbridge Group

2003 Medal Recipients

- » William C. Lennox, Civil Engineering Professor at University of Waterloo
- » Brian W. McFadden, President, Optical Networks of Nortel Networks Corporation
- » William M. Tatham, CEO and Managing General Partner of XJ Partners Inc.

2002 Medal Recipients

- » Arthur F. Church, President and CEO of Mancor Industries Inc.
- » Wai-Cheung Tang, Vice-President, Corporate Research and Development, COM DEV International

2001 Medal Recipients

- » Anthony P. Franceschini, President and CEO of Stantec Inc.
- » David S. McLeod, Vice-President, Health Issues and Member Relations of the Ontario Hospital Association
- » Mark P. Turchan, Managing Director of Seurat Corp.

2000 Medal Recipients

- » Richard C. Ducharme, Chief General Manager of Toronto Transit Commission
- » Jim Estill, President and CEO of EMJ Data Systems Ltd.
- » Kenneth R. Nichols, Chairman and CEO of Ventra Group Inc.

1999 Medal Recipients

- » Raymond L. Alarie, President of Stanley Consulting Group Ltd.
- » Mark J. Chamberlain, President and CEO of Wescam Inc.
- » P.S. Krishnamoorthy, Executive Vice-President of SNC-Lavalin

1998 Medal Recipients

- » William A. Cole, President of Etymonic Design Incorporated
- » Peter A.R. Glynn, President and CEO of Kingston General Hospital
- » Paul M. Koch, Marketing and Management Consultant
- » Paul P. Koenderman, President of Babcock & Wilcox Canada

1997 Medal Recipients

- » Adrian B. Ryans, Professor of Business Administration at Western Business School, The University of Western Ontario
- » Paul B. Spafford, Vice Chairman of CIBC Wood Gundy Securities Inc.
- » Carl J. Turkstra, President and CEO of Turkstra Lumber Co.
- » Donald J. Walker, President and COO of Magna International Inc.

1996 Medal Recipients

- » William T. Hancox, Vice-President, Strategic Development at Atomic Energy of Canada Ltd.
- » Michael (Mac) L. Voisin, President and CEO of M&M Meat Shops Ltd.
- » Kathryn L. Woodcock, Visiting Assistant Professor of Industrial and Manufacturing Engineering at Rochester Institute of Technology

1995 Medal Recipients

- » Douglas R. Lloyd, Professor at The University of Texas at Austin
- » Robert G. Rosehart, President of Lakehead University
- » Michael C. Volker, Chair and CEO of Mindflight Corp.
- » Peter Watson, Chief Executive at AEA Technology

1994 Medal Recipients

- » John Bergsma, President of Union Gas Ltd.
- » Don Haycock, Treasurer of Conestoga Rovers and Associates Ltd.
- » Frank Rovers, President of Conestoga Rovers and Associates Ltd.
- » J. Norman Lockington, Vice-President, Technology, at Dofasco Inc.

waterloo engineering

CPH

Carl Pollock Hall

- » High Voltage Engineering Laboratory
- » Multi Media Computer Lab
- » Pulley Computer Lab
- » System Dynamics Lab

DC

William G. Davis Computer Research Centre

- » Centre for Integrated Radio Frequency Engineering (CIRFE)
- » Energy Harvesting Laboratory
- » Information Systems and Science for Energy Laboratory (ISS4E)
- » Lab for Biomanufacturing
- » Laboratory of Computational Intelligence and Automation (LCIA)
- » Mechatronics Vehicle Lab

DWE

Douglas Wright Engineering Building

- » Environmental Microbiology Laboratories
- » Pilot Plant Facility
- » Sediment Laboratory
- » Soil and Groundwater Remediation Research Laboratory
- » Wastewater Research Laboratory

E2

Engineering 2

- » Advanced Interface Design Lab
- » Centre for Pavement and Transportation Technology Lab (CPATT)
- » Usability and Interactive Technology Lab

E3

Engineering 3

- » Air Pollution Research Innovation Laboratory (APRIL)
- » Centre for Advanced Materials Joining (CAMJ)
- » Engineering Main Machine Shop
- » Fluid Mechanics Research Laboratory
- » Giga-to-Nano Centre (G2N)
- » Green and Intelligent Automotive (GAIA) Research Facility
- » Microelectronics Heat Transfer Laboratory
- » Non-destructive Testing Laboratory
- » Wind Energy Laboratory
- » Sensors and Intergrated Microsystems Lab (SIMSLAB)
- » Waterloo Microfluids Laboratory

campus



The Centre for Intelligent Antenna and Radio Systems (CIARS) Electromagnetic Radiation Lab is located in Engineering 5.

Global Reputation

With exceptional teaching and research facilities, Waterloo Engineering ensures our faculty members and students have access to cutting-edge equipment and laboratories.

E5 Engineering 5

- » Engineering Student Machine Shop 1
- » Electromagnetic Radiation Lab - Anechoic Chamber (ERL)
- » Gear Computer Lab
- » High Performance Computational Facility
- » On-Chip Lab
- » Rapid Prototyping Lab (RPL)
- » RF/Microwave and Millimeter Wave System Lab
- » Sedra Student Design Centre
- » Smart Distribution Research Lab (SDRL)
- » THz-Photonics and Sub-Millimeter-Wave Integrated System Lab
- » Waterloo Autonomous Vehicles Laboratory (WAVELab)

E6 Engineering 6

- » Applied Catalysis Lab
- » Bioadhesion and Materials Lab
- » Solid Oxide Fuel Cells and Reaction Engineering Lab
- » Electrochemical Engineering Laboratory
- » Pollution Control Research Laboratory
- » Bioproducts Laboratory
- » Laboratory for Single Cell BioEngineering
- » Systems Biology Laboratory
- » Applied Nanomaterials & Clean Energy Laboratory
- » Carbon Nanomaterials Laboratory

E7 Engineering 7 (opening 2018)

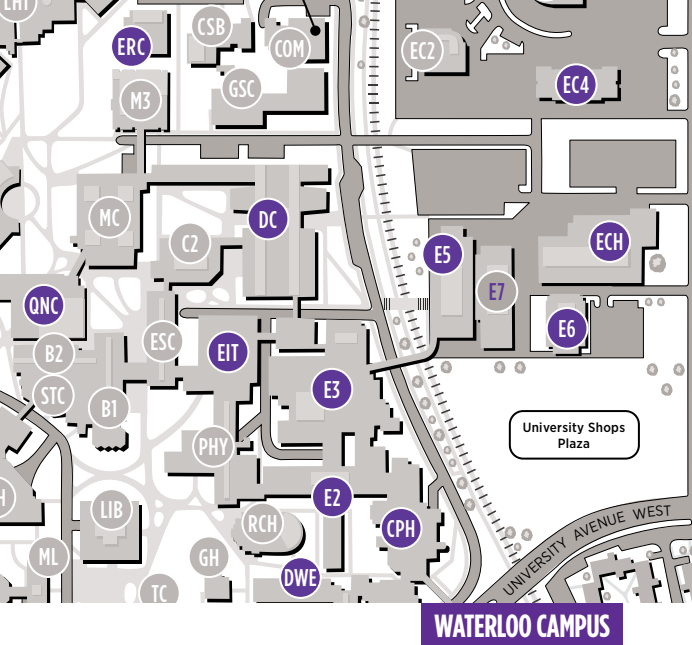
- » Engineering Ideas Clinic
- » RoboHub Advanced Robotics Testing Facility
- » Electronics Component Shop
- » Additive Manufacturing Lab
- » Student Capstone Design Garages

ECH East Campus Hall

Engineering Student Machine Shop 2

EC4 East Campus 4

- » Advanced Robotics
- » Multiscale Additive Manufacturing Lab
- » Vision and Image Processing Lab



EIT Centre for Environmental and Information Technology

- » Electricity Market Simulation and Optimization Lab (EMSOL)
- » Energy Harvesting Laboratory

ERC Energy Research Centre

- » Advanced Glazing System Laboratory (AGSL)
- » Air Pollution Research and Innovation Laboratory
- » Centre for Advanced Photovoltaic Devices and Systems (CAPDS)
- » Fuel Cell and Green Energy Lab
- » Laboratory for Emerging Energy Research (LEER)
- » Solar Thermal Research Laboratory (STRL)

QNC Mike & Ophelia Lazaridis Quantum-Nano Centre

- » Molecular Beam Epitaxy Facility (MBE)
- » Printable Electronic Materials Lab
- » Quantum NanoFab Facility

Off Campus

- » School of Architecture
- » Conrad Business, Entrepreneurship and Technology Centre
- » Vehicular Mobile Radio Network Lab and Outdoor Test Road Track
- » UW Live Fire Research Centre

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