MESSAGE FROM THE DEAN

Every engineering institution in Canada is accredited by the Canadian Engineering Accreditation Board, and institutions regularly undergo accreditation visits. When the School of Engineering underwent its regular accreditation visit this past year, one of the overwhelming themes I heard during the process was the consistency and character of its people and programs. That consistency and character is well-documented within the pages of this annual report.

The seed of the School of Engineering was to build an institution that would embrace its locale and act as a catalyst for innovation. In just over a decade, the School is already succeeding in addressing those goals through its research and academic pursuits.

In addition to conducting research with global impact, students and faculty are building a vibrant knowledge economy in the region, supporting entrepreneurship and creating a successful venture ecosystem.

Through this year’s Annual Report, you will discover some of the exciting endeavours that exemplify the consistency and character that embodies the School of Engineering.

James Olson, PEng, PhD, FCAE
Dean, Faculty of Applied Science
Professor of Mechanical Engineering

MESSAGE FROM THE ASSOCIATE DEAN

The 2018-19 academic year has been another exceptional year of academic and research achievement; in amongst the sustained growth the School of Engineering has been experiencing since its inception.

Inside this year’s Annual Report, you will learn about the incredible people within our School who make it such an impactful institution that is making a difference everyday.

This past year, we have announced an industry-funded Smart Energy Chair and new Eminence-funded research clusters headed by School of Engineering researchers. These research initiatives continue the School of Engineering’s extraordinary momentum.

Our alumni are also making their mark in industry and academia around the globe. Many alumni joined us in late October for the inaugural Homecoming at UBC’s Okanagan campus. Their continued success is our success, and we are tremendously proud of their achievements.

The accomplishments of our students, faculty, alumni and staff this past year continue to propel us forward towards the next stages of our evolution.

Rehan Sadiq, PEng, PhD
Associate Dean, School of Engineering
UBC’s Okanagan campus
Research

The rapid evolution and development of research at the School of Engineering has resulted in new research collaborations and facility expansions to address this growth. In 2019, some research facilities will open in a new research space at 1540 University Way as part of the first phase of UBC Okanagan’s Innovation Precinct.

Funding

- **RESEARCH FUNDING 2018/19 Fiscal Year Projects**
  - Tri-Council Funding: $2,920,922 (43%)
  - Other External Funding: $2,151,420 (31%)
  - UBC Internal Funding: $1,097,198 (16%)
  - Research Infrastructure: $702,433 (11%)
  - **TOTAL EXPENSES**: $6.9M

- **FUNDING BY DISCIPLINE**
  - Civil: $3,316,450 (31%)
  - Electrical: $1,748,562 (24%)
  - Mechanical: $1,406,961 (44%)

- **MITACS INTERNSHIPS**
  - 59 internship units
  - 83% of total UBCO Accelerate Funding
Research headlines

TUNED IN TO THE SOUND OF LIGHT
New research from the School of Engineering may have uncovered the keys to one of the darkest secrets of light – Kenneth Chau

RETROFITTING DONATION BINS
UBC engineering students tasked with designing safer donation bins after series of deaths – Ray Taheri

SPEEDING UP BACTERIAL INFECTIONS DIAGNOSIS
Using a small and inexpensive biosensor, researchers at UBC Okanagan have built a diagnostic tool that provides health care practitioners almost instant diagnosis of a bacterial infection – Mohammad Zarifi

IRONING OUT THE WRINKLES IN TEXTILE COMPOSITE MANUFACTURING
UBC team reduces wrinkles in textile composite manufacturing. Even the smallest of wrinkles during the manufacturing process can diminish textile composite strength by up to 50 percent – Abbas Milani

TALL TIMBER BUILDINGS TO WITHSTAND TORNADOES
UBC’s School of Engineering and Western University provides a roadmap to safer building designs in tornado-prone areas – Matlyas Bezabeh (Solomon Tesfamariam)

NANOTECHNOLOGIES TO REDUCE OPIOID ABUSE
Nanotechnologies can help address drug addiction by identifying the most at-risk individuals and help develop new therapeutic targets and personalize appropriate treatments – Sepideh Pakpour

A BUILDING METHOD AS OLD AS DIRT IS A Viable MODERN CONSTRUCTION MATERIAL
Compressed soil, also known as rammed earth, is a method of construction that dates back centuries – Sumi Siddiqua

TIME TO RETHINK CONSTRUCTION IN WATERWAYS
New research looks at impact of construction on natural habitats – Greg Courtice (Deborah Roberts)

HARNESSING THE POWER OF VIRTUAL REALITY
Engineers take detour to help immerse builders in their environments – Vincent Loi (Kenneth Chau)

DRY BOATS
Hydrophobic particle compound will keep boats dry and travel faster – Kevin Golovin

NOT YOUR EVERYDAY TEST DRIVE
The first-ever personal belongings carrier, specifically designed for homeless people, is ready to roll onto Kelowna sidewalks – CRN Network – Okanagan Laboratory

WIRELESSLY EFFICIENT POWER
Researchers have discovered a way to balance power transfer efficiency with power loss due to inactivity in wireless power transfer systems – Connor Badowich (Loïc Markley)

NEW TECHNOLOGY PRODUCES LIVING, 3D PRINTED BIO-TISSUES
Researchers hope to make advances in tissue replacement and cancer research through new 3D printing technology – Keokyoung Kim

STRETCHY, WEARABLE TECH
New GNF sensor pad could be the key to developing inexpensive wearable tech. The GNFs create a rubber-like adhesive pad that acts like a stretchable sensor while gathering information about a human body – Mina Hoofar, Homayoun Najjaran

WATER IS THE NEW FIRE
Researchers suggest municipalities should put a greater emphasis on green initiatives to reduce heavy rainfall flooding in urban areas – Yeknakel Abbe (Solomon Tesfamariam)

Innovation & collaboration

With an emphasis on research beyond disciplines, School of Engineering researchers focus on collaboration and innovation with community and industry partners. In 2018, nearly 300 individual research projects were undertaken with results published in top-tier publications. Those results are leading to impactful change for our community, our partners and our world.

2018/19 FISCAL YEAR PROJECTS

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<tr>
<th>Field</th>
<th>Civil</th>
<th>Electrical</th>
<th>Mechanical</th>
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<tbody>
<tr>
<td>Total projects</td>
<td>91</td>
<td>48</td>
<td>106</td>
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<tr>
<td>Outputs in Top 10 citation percentiles*</td>
<td>217</td>
<td>43</td>
<td>12K+</td>
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<tr>
<th>Key Research Collaborations</th>
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<tbody>
<tr>
<td>HYDROGEN RESEARCH</td>
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<tr>
<td>Lead Researcher</td>
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<td>Mina Hoofar</td>
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<tr>
<th>Publications</th>
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<tr>
<td>Scholarly Outputs</td>
</tr>
<tr>
<td>217</td>
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<tr>
<td>Outputs in Top 10 citation percentiles*</td>
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<tr>
<td>Citations</td>
</tr>
<tr>
<td>12K+</td>
</tr>
</tbody>
</table>

*Number of publications that are highly cited, having reached a particular threshold of citations received.

Notable Announcements

2019 UBC OKANAGAN RESEARCHER OF THE YEAR (NSERC) – Kasun Hewage
Through innovative approaches to life cycle management, Dr. Hewage has made significant breakthroughs in developing tools that enable builders and governments to make knowledgeable fact-based decisions pertaining to sustainable building practices.

2019 UBC OKANAGAN RESEARCHER OF THE YEAR – Kenneth Chau

FORTIS SMART ENERGY CHAIR – Kasun Hewage
New role seeks to optimize energy use in BC and reduce the province’s greenhouse gas footprint.

OFFICIAL LAUNCH OF OKANAGAN INNOVATION CENTRE
UBC opens downtown facility to provide a space designed to promote interaction between the University’s research community and the region’s innovation network.

GREEN CONSTRUCTION RESEARCH & TRAINING CENTRE ANNOUNCEMENT
UBC Okanagan and Okanagan College sign letter of cooperation to promote construction research and training initiatives. Lead researcher – Shahria Alam

CLUSTER OF RESEARCH EXCELLENCE IN BIOCOMPOSITES
Developing novel agricultural and forestry-based biocomposites to minimize the impact of conventional plastics on the environment. Lead researcher – Abbass Milani (Eminence Funding)
Through funding allocated by the government of British Columbia, UBC Okanagan launches a Manufacturing Engineering Program (MANF) in conjunction with UBC Vancouver. The program is led by members of the advanced manufacturing cluster at both campuses, and will have a transformative impact on the areas of aerospace, automotive, energy, machinery and medical device industries.

Professor Homayoun Najjaran has accepted the role of Associate Director to oversee the program’s successful roll out at the Okanagan campus.

The program in Vancouver will focus on Production Technology while the Okanagan will focus on Production Management. In the Okanagan, the program will hire six assistant professors and one Education Leadership instructor.

40 student intake per year across the two campuses

~130 students on the Okanagan campus (when the program is fully operational)

Nearly eighty percent of enrolled students at the School of Engineering are domestic; with one-third of that number originating from the Okanagan. Since inception, enrollment has risen at a steady rate and maintains a trajectory that projects 2000 undergraduate and 500 graduate students by 2025.

This growth is indicative of demand generated from forward-thinking academic programming and innovative research that strives to address the multi-disciplinary needs of local, provincial, national and global stakeholders.

New Options

RESILIENT INFRASTRUCTURE MANAGEMENT
Equipping students with multi-disciplinary knowledge, theories and skills needed to manage aging infrastructure

MECHATRONICS
Students learn state-of-the-art skills, theories and methodologies related to electrical and mechanical systems

Inclusivity & diversity

BRINGING INDIGENOUS PERSPECTIVES AND BEST PRACTICES INTO THE CLASSROOM
New funding from UBC Okanagan’s Aspire Learning and Teaching (ALT) Fund brings Indigenous-focused modules into the Engineering curriculum. Over the next three years, Indigenous-focused modules will be added to the Engineering curriculum enhancing the existing Applied Science program. The School of Engineering’s Ian Foulds and Jannik Eikenaar are leading the initiative.

17% Undergraduate students are female
11% ↑ Registered female students*
22% ↑ Registered Indigenous students*

* Since 2017
Student & alumni success
School of Engineering has 1551 alumni since the first graduating class in 2009. Our outstanding alumni have become a major force throughout industry and academia in Canada and around the world. The lessons they learned at UBC and the networks they developed are the foundation of their success.

2018 CONVOCATION NUMBERS
8 PhD
24 MASc
20 MEng
214 BASc

Awards & recognition
James Seabrook BASc '11
2018 UBC Alumni Builder Award Recipient

Matiyas Bezabih
Young Scientist Award 2018 World Conference on Timber Engineering

Bridge Preservation Building
4th place, 2018 Association for Preservation Technology Student Design-Build Competition

Julianna Neudorf and Shena Changirwa
2nd place at 2018 Canadian Society for Civil Engineering Conference in Fredericton, New Brunswick

Great Northern Concrete Toboggan Race
3rd place OVERALL & Best Concrete Mix Design at 2018 GNCTR

Junchi Bin and Chengkai Zhang
2nd place at International “Sensor and Measurements” IEEE Student Contest in Houston, Texas

New faces
To address expanding enrollment and exciting new research opportunities, the School of Engineering welcomed a number of faculty and staff across all programs during the 2018-19 academic year.

FACULTY
Morad Abdolaziz
Mahmudur Fatmi
Nicolas Miguel Peleato
Alexander Uhl
Mohammad Arjmand
Natalie Forsman
Dean Richert

STAFF
Rhonda Hay
Samantha Luckow
Hassan Iqbal
Marie O’Brien

Announcements include Alec Smith named Lab Manager and Renée Leboe named Senior Advisor of the Student Advisor Team.

Performing research at the UBC School of Engineering helped equip me with the skillset to build and lead a research program.

Christopher Collier (PhD, Electrical) & Assistant Professor at the University of Guelph.

When I was at UBC Okanagan I realized being able to conduct research in a smaller campus is ideal.

Nilufar Islam (MASc, Civil ’10 & PhD ’15) & Project Engineer at the City of Vancouver’s Sewers & Drain Design Branch | 2013 recipient of the NSERC Alexander Graham Bell Canada Graduate Scholarship Grant.