October 2017 Faculty of Engineering & the Built Environment University of Cape Town Vol. 13 Issue 3

Faculty Newsletter




Message from the Dean

I am writing this in the midst of a very turbulent time on campus. The Fees Commission report has not yet been released and we are currently not doing face-to -face teaching. The situation is very fluid, so I won't try and do a full update in this message!

I would like to thank all the staff who were involved in the recent accreditation visits. An incredible amount of work is done in preparation for the visit and without your dedication and hard work, the visits would not have been a success. So, a big thank you to everyone and especially to A/Professor Brandon Collier-Reed who coordinated the ECSA visit and ensured the smooth running of events throughout the day.

The ECSA accreditation visit was to reassess the interim accreditation given to the Civil and Electrical Engineering Departments on ECSA's last visit in 2015. The feedback received by the departments after the visit indicates that they have met all the accreditation requirements and that the Visit Leader will be recommending to ECSA that the programmes be accredited up until the next regular accreditation visit in 2020.

CEM hosted an accreditation visit from the South African Council for the Project and Construction Management Profession (SACPCMP) for the accreditation of the BSc Construction Studies and BSc Honours in Construction Management. These accreditation visits take place every five years. A/Professor Kathy Michell felt the visit was positive, but the outcomes will only be known at the end of November. Thank you to all the CEM staff who were involved.

The Faculty Office has been extremely busy and by 25 October, they had dealt with 12780 undergraduate applications. We have made 2439 undergraduate offers for 2018, and 1368 have accepted. However, this number does include those who have been made an offer for two choices, so if we only count the single offers, we have made 2008 offers and 1112 have accepted.

During these times of uncertainty, we need to celebrate the remarkable staff and students we have in the Faculty. The newsletter is full of amazing stories. Thank you to everyone for the contribution you make to the faculty and the merit that you bring to EBE.

Explosion protection: reality or fantasy

On 12 September, Professor Genevieve Langdon gave her Inaugural Lecture, titled *Explosion protection: reality or fantasy.*

Can we really protect against explosions? Unfortunately, explosions often make the headlines because they cause devastating damage and loss of life. Professor Langdon spoke about the reality of explosions, the different types of explosions that happen and the ways we can protect against their devastating effects. She described some of the protection options available and how they work. She also discussed some recent projects at UCT that seek to understand the response of materials and structures to explosion loading by measuring what happens during an explosion.

The full article on the lecture can be found here.

Prof Genevieve Langdon with some of the special guests at her inaugural lecture: her sons David (left) and Jonathan, and husband Gareth

Future Water

On Friday 20 October, Future Water Institute hosted two public lectures under the theme *Society, water and wastewater.* Professor Craig Sheridan, Director of the Centre in Water Research and Development at the University of the Witwatersrand, spoke on "Water in South Africa: Devastating droughts, population expansion, climate change, poor governance, energy and food shortages and macro-pollutants. In his lecture he painted a picture of how society impacts water and how water impacts society in the context of South Africa."

The second speaker, Professor George Ekama from Water Quality Engineering in the Department of Civil Engineering, spoke on "Some opportunities and challenges for urban wastewater treatment." Professor Ekama considered two urban water management strategies to conserve fresh water quality and quantity—the separation of urine at source and sea water toilet flushing.

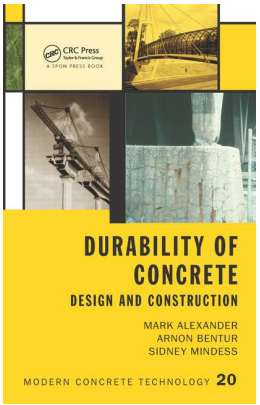
While considerable work is still required to evaluate these new approaches, and quantify their advantages and disadvantages, Prof Ekama argued the point that investment in dual water distribution and wastewater collection systems may be worth making to unlock benefits for more sustainable urban development.

Architecture host James Inedu George

In September, the School of Architecture, Planning & Geomatics hosted James Inedu George, an architect and Design Director of HTL practicing out of Lagos, Nigeria, where his immediate focus is on Innovative Sustainable Solutions and Future African Cities.
You can see more of his practice work at https://www.htlafrica.com/office/

James delivered a talk titled "???(Towards) a new core???" A story about a search for new parameters for architecture in Africa through Economics and History and a catalogue of the application of this new theory into architecture. During his time in the School, he joined studio reviews in both undergrad and graduate studios.

New book for Professor Mark Alexander



Emeritus Professor Mark Alexander from the Department of Civil Engineering has co-authored a book titled *Durability of Concrete—Design and Construction*. The other co-authors are Emeritus Professor Arnon Bentur from the Department of Civil and Environmental Engineering at the Technion-Israel Institute of Technology, Haifa, Israel, and Emeritus Professor Sidney Mindess from the University of British Columbia in Vancouver, Canada.

The book provides an up-to-date survey of durability issues, including durability design and specifications, as well as how to actually achieve durability in concrete construction.

Antarctic Marginal Ice Zone Pilot Project

In July, members of UCT's Sea Ice Research Team had another successful trip to the Antarctic Marginal Ice Zone (MIZ) aboard the ice-breaking research vessel SA Agulhas (MIZ). The frequent storms and harsh weather in winter made it a difficult working environment but, despite this, the trip was a success, building upon the first research trip carried out last year.

The MIZ Pilot Project is a multi-disciplinary research effort, headed by A/Professor Marcello Vichi from the Department of Oceanography, and Dr Keith MacHutchon and Dr Sebastian Skatulla from the Department of Civil Engineering. The principal objectives for this trip were to:

- obtain core and pancake samples of the MIZ sea ice to determine physical and mechanical properties
- deploy trackers to measure floe movement and waves in ice
- carry out sea ice observations for defining the boundaries of the MIZ and collecting data for the Antarctic Sea-ice Processes and Climate expert group.

The coring and pancake sampling were carried out by the Sea Ice Sampling Team, consisting of Dr MacHutchon, Dr Skatulla, PhD student Rutger Marquart from Civil Engineering, and MSc students Emmanuel Omatuku Ngongo (Civil Engineering) and Benjamin Hall (Chemical Engineering).

Benjamin Hall, Rutger Marquart, Emmanuel Ngongo, Dr Keith MacHutchon, Dr Sebastian Skatulla

The team had to carry out the deployment of the trackers onto pancake ice in high winds and sub-zero temperatures. Pancakes were collected, with the smaller ones being taken whole for physical and mechanical testing while the larger ones were cored on deck, allowing a greater variety and number of samples to be taken.

The samples were analysed on board the ship for their physical properties, including temperature and salinity, with the majority being transported to UCT, where the samples will be stored and undergo mechanical testing to determine the strength, stiffness, fracture toughness, and viscous-elasticity of sea ice, as well as undergoing crystallographic investigations.

Deployment of trackers onto pancake ice

Both the physical and mechanical results will be used as parameter inputs for a computational model being developed by the Computational Continuum Mechanics Research Group headed by Dr Skatulla and overseas collaborators, who were also part of this voyage. The aim is to study and predict the break-up and fracture evolution of sea ice during the Antarctic spring, advance understanding of the complex material behavior of sea ice in terms of its liquid and gas-filled porous structural composition and elucidate the mechanisms of biogeochemical exchanges with the underlying ocean and the brine expulsion.

The cruise was an example of successful multi-disciplinary and international collaboration between the department of Oceanography and EBE Faculty at UCT, and the Cape Peninsula University of Technology, Stellenbosch University, Technical University of Dortmund, University of Duisburg-Essen, University of Melbourne and New York University Abu Dhabi. Results and data from this cruise will be shared between the collaborating parties, allowing for a comprehensive and detailed understanding of the Antarctic MIZ to be developed. This is an ongoing endeavour, and the participants hope to build upon what was learnt in this expedition and return next year to obtain further samples and data about pancake ice and core on consolidated ice.

Coring of pancake ice on board

Housing Finance course attracts people from all over Africa

Senior policy makers, investors, developers and housing professionals from across Africa gathered in the Waterfront to attend the Housing Finance course for Sub-Saharan Africa. They came from as far as Nigeria, Gabon, Zambia, Mozambique, Kenya, and Tanzania.

The Housing Finance course for Sub-Saharan Africa was established in 2012 and is run in a partnership between the UCT Nedbank Urban Real Estate Research Unit (URERU) at the University of Cape Town and the Wharton School at the University of Pennsylvania, and is supported by the Centre for Affordable Housing Finance in Africa. While all the teachers and presenters on the course are recognised leaders in their fields, the course is anchored by the world-renowned housing finance expert Dr Marja Hoek-Smit

Sub-Saharan Africa faces a major housing challenge related to rapid urbanisation and new urban household formation. Formal housing construction has not kept up with urban growth, resulting in deteriorating conditions of the existing housing stock and growth in informal settlements. Rob McGaffin from URERU said, “To scale up new formal construction, housing finance systems need to expand and innovate urgently. The course provided the necessary analytical tools and understanding to become constructive partners in improving and expanding housing finance systems in their countries.”

Rob McGaffin (centre) with representatives from across Africa attending the Housing Finance course for Sub-Saharan Africa.

The course covered the role of housing and housing finance, the key elements of a housing-finance system, the business of housing finance, the funding and safety and soundness of financial institutions and how to take a range of housing-finance products to lower-income households. The wide range of participants on the course allowed for the cross-fertilisation of ideas and excellent networking opportunities. On Thursday, delegates were taken out to three housing developments in Langa, Khayelitsha and Delft.

Green Mining: Beyond the Myth

In August, Minerals to Metals, together with Mineral Law in Africa, coordinated a one-day interactive workshop titled “Green Mining: Beyond the Myth.” The event was organised by the UCT and AngloGold Ashanti partnership team comprising Professor Dee Bradshaw, adjunct professors Brian Chicksen and Caroline Digby, Professor Hanri Mostert, Herman Meyer and A/Professor Jennifer Broadhurst. It brought together leaders and experts from industry, business, government, civil society and academia. Included in the programme was mining artist Jeannette Unite, who collects waste and minerals from smelters, slime ponds, mine dumps and heritage sites to make her own paint and pastels.

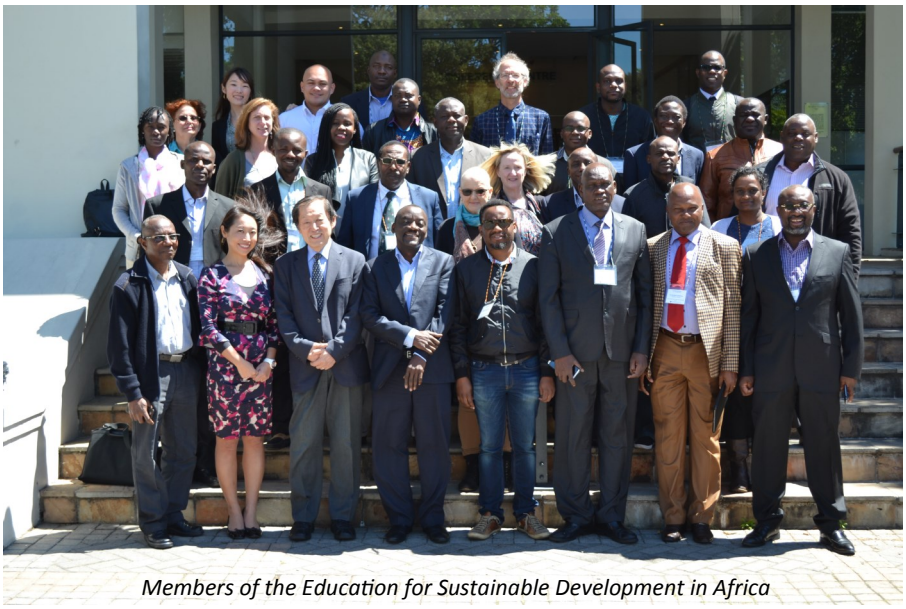
The day was an opportunity for postgraduate students and young career researchers from the Minerals to Metals Initiative and Mineral Law in Africa to introduce their own innovative research, what Executive Director of Research Dr Marilet Sienaert described as “disruptive ways of thinking”.

Intense discussion around ethical leadership in the context of mining at the table led by Nozipho January-Bardill, non-executive director of AngloGold Ashanti.
***Photo by** Julian Goldswain*

Read the full article

Education for Sustainable Development in Africa

On 16 October, the third meeting of the Education for Sustainable Development in Africa (ESDA) consortium was attended by members of the eight African partner universities, and representatives from the African Development Bank, who fund the programme. Professor Harro von Blottnitz, the coordinator of the MPhil degree specialising in sustainable Mineral Resource Development, which forms part of the ESDA project, organised the event at Belmont Square in Rondebosch.



Members of the Education for Sustainable Development in Africa

In his opening welcome, the Chair of ESDA, Professor Peter Mbithi, Vice-Chancellor of the University of Nairobi, said, "As a leader of African higher education, I am keenly aware of both the enormity and criticality of sustainable development challenges Africa is facing today. As clearly articulated by African Union's 2063 Agenda: The Africa We Want, we are all engaged in a major structural transformation of the continent through achievement of long-term and wide-spread growth which is at the same time more inclusive, more green and more resilient."

ESDA is an inter-university collaboration programme of graduate training and research among eight African partner universities for promoting sustainable development in Africa. Its mission is to contribute to the promotion of Africa's sustainable development through training of professionals who may serve as planners, organisers, instructors, researchers, field development agents and practitioners and organisation of supporting research and information-sharing activities. In pursuing this mission, ESDA partner universities are not only to collaborate among themselves to improve the quality of education and research activities they engage in, but also to seek active interaction and close cooperation with government agencies, industries, local communities and civil-society organisations.

On the final day, delegates were taken on a field trip to UCT's Graduate School Of Business's satellite campus, Solution Space in Philippi.

Master class in Transport Justice

In August, Professor Mark Zuidgeest from the Centre for Transport Studies in Civil Engineering hosted a visiting academic, Professor Karel Martens, who is from the Technion-Israel Institute of Technology in Haifa, Israel, and Radboud University in Nijmegen, The Netherlands. During his visit, Professor Martens gave a master class in Transport Justice, which was attended by 38 people representing government, City of Cape Town, NGOs, urban planners, transport professionals and postgraduate students.

Read the article

Professor Karel Martens
Photograph by Angus Rule

Awards for CEM

In September, the School of the Built Environment at the University of Salford in Manchester held an International Research Conference which attracted key international players and speakers from industry, academia and the research community.

At the conference, A/Professor Kathy Michell and her PhD student, Unekwu Adama, received the International Council for Research & Innovation in Building & Construction (CIB) award. The award was for a paper titled *Potential Effects of Technological Innovations on Facilities Management Practice.*

A/Professor Abimbola Windapo and her PhD student, Alireza Moghayedi, received the Emerald Publishing award for the paper titled *Building Material Price Differentiation in South Africa: The Role of Retailers and Location*.

A/Professor Kathy Michell, Unekwu Adama and A/ Professor Abimbola Windapo

Kathy Michell with Dr Stephen Ramabodu – the current President of the Association of South African Quantity Surveyors

The President, Executive and Board of the Association of South African Quantity Surveyors honoured A/Professor Kathy Michell with a Meritorious and Outstanding Service to the Quantity Surveying Profession Award. The award was made in acknowledgement of the enormous and positive differences that Kathy's leadership has brought about to the quantity surveying profession during her time as President of the South African Council for the Quantity Surveying Profession.

In August, Alain Alexander received the Association of South African Quantity Surveyors' Gold Medal award for the best 2016 quantity surveying student in South Africa. The award is given to the student whose academic achievements are of outstanding merit and whose personal qualities promise to contribute positively to the profession. Alain graduated with distinction at the end of 2016 with his Quantity Surveying Honours degree. During his time at UCT, he was an active member of the Association of Built Environment Students (ABES) and he was elected chairperson in 2016.

Alain Alexander with Dr Stephen Ramabodu

Karen Le Jeune, a lecturer in the department, said, "Alain was the type of student who went beyond the call of duty - although he had his committee, he led by example. He is such a self-effacing young man, humble yet determined, that it was an absolute pleasure working with him. As you know, ABES is integral to the department's academic programme and beyond, and the size of Alain's footsteps will be hard to fill. This young man embodies all UCT's graduate attributes and makes them shine."

Best Paper award

A/Professor Olabisi Falowo's PhD student, Mary Adedoyin, has recently received two best-paper awards at international conferences.

The first one was at the 20th Southern African Telecommunication Networks and Applications Conference (SATNAC) held on the Freedom of the Seas Cruise Liner from 3 to 10 September 2017. The paper, titled *QoS-Aware Radio Resource Allocation for Green Wireless Communication in 5G Networks* proposes a QoS-aware algorithm with adaptive modulation and coding scheme (QRRA-AMC) capable of mitigating cross-tier and co-tier interference in heterogeneous wireless networks by minimising the transmit power for green communication

The annual SATNAC is the continent's leading ICT conference and attracts around 400 delegates every year. The event is hosted under the auspices of Telkom and is the only conference of its kind that puts students, academics and government representatives under the same roof as specialists and leaders from industry.

In October, Mary received a best student paper award at the 28th Annual IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (IEEE PIMRC 2017), which was held in Canada. The theme of the symposium was "Engaged Citizens and their New Smart Worlds". IEEE PIMRC is one of the premier conferences in the wireless research arena and has a long history of bringing together academia, industry and regulatory bodies**.** Today, it has become one of IEEE Communication Society's flagship conferences in telecommunications. IEEE PIMRC 2017 accepted 620 papers from over 50 countries for oral presentation at the conference.

Mary Adedoyin with Dr Olabisi Falowo

The paper, titled Qos-Aware Radio Resource Allocation for Ultra-dense Heterogeneous Networks proposes a QoS-aware radio resource allocation algorithm for a cognitive femtocell to minimise cross-tier and co-tier interference, and to provide QoS guarantees for different users in ultra dense heterogeneous wireless networks. Mary Adedoyin co-authored the paper with her supervisor, A/Prof. Olabisi Falowo.

Best published paper for Planning

A/Professor Tanja Winkler and James Duminy received the Association of European Planning of Schools (AESOP) "Best Published Paper Award 2017". James is a PhD student with Professor Vanessa Watson and is based in the African Centre for Cities.

The purpose of the award is to celebrate urban planning scholars' work publishing in international planning journals. It also serves to bring to the attention of planning academics and other interested parties the range of academic work being undertaken in the spatial planning field and to learn from different planning cultures across the global South and North. Annually, the Editorial Boards of more than 50 European planning journals are invited to nominate the best published papers of their journal for the prize.

James Duminy and A/Professor Tanja Winkler

One of top three presenters

Professor Mamokgethi Phakeng and Genevieve Harding

The Southern African Institute of Mining & Metallurgy Western Cape hosted a workshop at UCT on 2 August on "Developing the Business Case for Energy Productivity in the Minerals Sector." The workshop was followed by the minerals research showcase which took place on 3 and 4 August at the Philippi Village in the GSB Solution Space. The event was attended by students from UCT, UWC, Stellenbosch University, CPUT, Mintek and the Council for Geoscience.

Genevieve Harding, a master's student in the Crystallization & Precipitation Unit, was one of the top three presenters at the South African Institute of Mining and Metallurgy (SAIMM)'s mineral research showcase.

Genevieve presented on *Understanding industrial effluent water quality: What is the norm and why we need to do better.* The Deputy Vice-Chancellor, Professor Mamokgethi Phakeng, closed the event and handed over the awards.

Award for Professor Langdon

In August, Professor Genevieve Langdon from the Department of Mechanical Engineering received a Women in Science Award (WISA) from the Department of Science and Technology . The awards recognise and reward excellence by women scientists and researchers, and profile them as role models for younger women. The theme for the 2017 WISA was "Women's economic empowerment in the changing world of work", which is the 2017 priority theme for the United Nations Commission on the Status of Women.

2018 ABES council

Members of the 2018 Association of Built Environment Students (ABES) were elected into office in September. Out of the ten members, eight are women. ABES is very active on campus and looks after the built environment students. It holds numerous events on campus and organises the community build for the first-year construction students.

The members are, from left to right:

Amy Ledwidge (Chair)
Michelle Scholtz
Onele Kala
Linda Ndebele
Chandeline Jordaan
Enid Mneney
Sesi Nxumalo
Junior Nkadimeng
Andrew Bray (Head mentor)

ChemEng graduates doing great things

Ten recent graduates from the Department of Chemical Engineering will be completing their master's degrees abroad, with the bulk of students attending the Cambridge University in the UK. A number of them received prestigious scholarships for their studies.

- Chris Molteno (2015), Caroline Still (2015), and Cara Bea Davidson (2016) will be attending CambridgeUniversity to do a MPhil in Engineering for Sustainable Development.
- Tayla Grant (2016), Theona Moodley (2016) and Timothy Pons (2016) will be doing a MPhil in Advanced Chemical Engineering at Cambridge University.
- Victoria Blackbeard (2016) will be doing a MPhil in Bioscience Enterprise at Cambridge University.
- Usisipho Gogela (2015) will be doing an MSc in Innovative and Sustainable Chemical Engineering at Chalmers University of Technology in Sweden.
- Alexandra Stuart-Smith (2016) will be attending the Imperial College of London to do an MSc in Biomedical Engineering specialising in Biomaterials and Tissue Engineering.
- Jordan Delbridge (2016) will be doing an MSc Biomaterials and Tissue Engineering at University College London.

Read the full article here

Eskom Cape Town Expo for Young Scientists 2017

The annual Eskom Science Expo took place in August in the Sports Centre on upper campus. It was great once again to see so many EBE staff and students involved in the event. The Department of Electrical Engineering manned a table filled with interesting gadgets and robots which learners could interact with while waiting for the judging to take place. The projects ranged from sustainability, to energy, ocean pollution, solar power, and grey water solutions, and one even had a possible solution to choosing the best university through decision modelling.

Olga Peel, one of the main organisers of the Cape Town expo, said, "The help and encouragement given by UCT staff was simply amazing and there were so many instances where things would not have happened smoothly (or at all) if someone from UCT had not been present to keep things going."

High school learners interacting with Jason Hardy, an electrical engineering master's student, and Do Yeou Ku, a final-year mechatronics student.

Faculty News

Welcome to new staff

Mr Zaeem Najar joined the Crystallisation and Precipitation Unit in October as the finance/admin officer. Zaeem was previously in the Department of Chemical Engineering at UCT.

Mr Madoda Sigonyela joined the finance section of the Faculty Office as the Senior Finance Officer.

Resignations

Mr Jonathan Green, a lecturer in the School of Architecture, Planning & Geomatics , left at the end of July.

Mr Lerato Mohapi, a research officer in the Department of Electrical Engineering, left at the end of August.

Dr Shiro Tanaka, a key technology specialist in the Centre for Catalysis Research, left in August as he had completed his contract.

CONGRATULATIONS

Pierre Bizimana from the Department of Electrical Engineering and his wife, Mauwa welcomed little Gabriel into the world on 24 July 2017.

New Senior Finance Officer

Welcome to Mr Madoda Sigonyela who joined the finance section of the Faculty Office on 2 October as the Senior Finance Officer. He will be taking over from Marlene Hyland, who retires at the end of the year. Marlene will work closely with him during this handover period. Madoda is already very familiar with most UCT processes. He graduated from UCT with a Bachelor of Social Science in 1999 and has many years of experience working in various finance roles at UCT. Bill Daubenton, the Finance Manager said, "I wish Madoda good luck during this transition and hope that everyone will join me in welcoming him as he starts his journey in EBE."

TEAM EBE

Tash Dilraj, Lucrishia Dennis, Lisa Williams and Isha Dilraj

Lisa Williams in the Faculty Office decided that the Faculty Office needed a little team-building, so she organised for Team EBE to participate in the Blisters for Bread walk which took place in August. Lisa, together with Mel Scheepers and her husband Grant and their five-year old son Casey, Isha and Tash Dilraj, their mother and father and their sister and her fiancé, as well as Lucrishia Dennis from the Admissions Office, made up Team EBE. The entrance fee of R50 will feed 20 hungry school children for a day. Lisa hopes that next year she will get more people participating.

Great achievement

Two remarkable women, Linda Chola, a cleaner in Centlivres, and Noziphiwo Sigwela, the Built Environment librarian, completed the Planning Theory course(APG4020F) in the first semester. The course is part of the Bachelor of City Planning Honours which is run by A/Professor Tanja Winkler.

On 24 August, they received a UCT Certificates of completion from the Dean at an event which was held to honour their achievement. Tanja said, "Their involvement in this course was mind-blowing; and by opening the classroom up to many different voices, we all learnt many new things."

A/Professor Tanja Winkler, Professor Alison Lewis and Linda Chola

Linda said she was curious about planning after listening to the students talking about it. Tanja invited her to attend the course, and she discovered that she loved it. She completed her matric at night school in 2005. Linda has been at UCT for 18 years, ten years in Centlivres and eight years at Café Quencha.

Nozi has been at UCT for ten years. She started an Introduction to Project Management course but did not complete it. She was delighted when she was invited to attend the Planning Theory course. "You can use the knowledge we have gained everywhere to help society," Nozi said.

A/Professor Tanja Winkler, Professor Alison Lewis and Noziphiwo Sigwela

Nobukhosi Ngwenya, a PhD student who was a tutor to Linda and Nozi, said, "It was very refreshing to have them both on the course. They bought a new perspective and my thinking was challenged."

After the success of their first course, they are now both ready to sign up for Planning in Law in the second semester.

Active citizens

Back: Thando Mazomba, Kumi Makhado, Kamva Tabata, Mandilakhe Mbhele, and Obonye Motokwane.
In the front: Phila Mtshali and Chris Sexwale

On 9 September, members from UCT's South African Institute for Civil Engineers (SAICE) student chapter became active citizens. They joined Green Pop, an NGO which plants trees through urban greening and reforestation projects, spreads environmental awareness, and activate people through green festivals and workshops across Southern Africa.

Chris Sexwale, vice-chair of UCT SAICE student chapter, raised money to plant 20 trees at the Bothasig clinic as part of Green Pop's urban greening. Staff from Green Pop will continue to monitor the trees over the next two years. Grey water will be used to water the trees.

3-minute thesis competition

Imuentinyan Aivinhenyo, a Carnegie PhD Research Student in Urban Engineering & Transportation in the Department of Civil Engineering, was the runner up in the 3 Minute Thesis competition which was held on 28 September on upper campus. Students have three minutes to present their PhD research to a non-specialist audience, verbally and with a single static Powerpoint slide.

Although Imuentinyan is an engineer, the work for his PhD was deemed by the judges to be a multi-disciplinary study with a Social Sciences focus. He was therefore judged in the Humanities/Social Sciences/Law/ Commerce category. The title of his presentation was *Measuring Accessibility to Jobs & Social Services in Cape Town: implication of transport affordability for the poor.*

The synopsis: Past planning systems in South African cities like Cape Town have created to a large degree a spatial disconnect between residents and opportunities, with the low-income population suffering more in terms of separation from main economic centres. The implication is that the poor travel a longer distance and hence bear a high cost of transportation. The objective of this research is to measure, visualise, and evaluate the level of job accessibility provided by the available public transportation system of Cape Town, and to demonstrate how income level and transport cost can impact on accessibility level for the low-income population.

The People's Choice award, which is voted for by the audience for the single more meritorious presentation, went to Sherlyn Gabriel from BISRU in the Department of Mechanical Engineering. Her presentation was titled the *The effect of blast loading on composites which contain sustainable materials.* The synopsis: Advancements in composites have made it possible to

Sherlyn Gabriel from BISRU

tailor to different applications while still being conscious about the environment. More sustainable product solutions are currently being implemented, yet little is known about the explosive loading of these materials. Knowledge of this can lead to further development of products that can also protect infrastructure and people. The focus of this research project is to understand how different materials, particularly those that are plant-based, respond to uniform blast loading. This requires understanding the different modes of failure, and identifying the possible impact thresholds and the progression of failure for the material.

From PhD to apps

Takunda Chitaka, a PhD student with Professor Harro von Blottnitz, was the first runner-up in a session called "From PhD to Apps" which was part of the 8th International Conference on Life Cycle Management conference. The conference took place in September in Luxembourg and is the leading forum worldwide bringing together 600+ scholars and practitioners from 40+ countries working in industry, academia and public institutions in the domain of life-cycle sustainability and circular economy.

Takunda's presentation was titled *Plastic End-of-Life: Managing material choice without another impact category indicator.* She said, "We had five minutes to present on the usefulness, feasibility and impact of our work in the context of how it could be transferred to industry and/or policy."

Professor von Blottnitz said "I'm proud that research out of Environmental and Process Systems Engineering, a research group in Chemical Engineering, was once again recognised by the international life-cycle management community. We remain engaged with advancements in this field."

#saving water

Nkosinathi Nkomo, a third-year civil engineering student, was unable to register in 2017 owing to lack of funds. To raise funds, he decided to apply some of the knowledge he had acquired practically by being part of the solution to the water crisis in Cape Town. He saw an opportunity in developing a greywater system which could be used in South African homes and places of business. He formed a company, AquaRenu, which aims to reduce the amount of water people use at home and work.

Nkosinathi Nkomo and Sesethu Mazangazanga

Nkosinathi called in friends to assist, and there is now a team of four. Sesethu Mazangazanga, a fourth-year civil engineering student, is the project manager; Njabule Gule, who is working and studying business part-time, is responsible for operations; and Monicca Masetola, a final-year student at Vega, does branding and marketing. Nkomo said, "I work with a team that is passionate to be part of the solution and is always willing to give a hand to provide South Africa with new solutions to the water issue."

AquaRenu's vision is to become a nationally recognised brand and to have its products a standard feature in typical South African homes. "We want to make the greywater and rainwater harvesting systems affordable for the average South African household while delivering a service that is comparable to other expensive manufactures," Nkomo said.

Sesethu added, "The area we currently specialise in is greywater irrigation, and part of our near-future design is harvesting rainwater to reduce water consumption in homes and businesses even further."

They are currently working on an exciting design that utilises rainwater and greywater as primary sources of water for irrigation and toilet flushing for large properties such as schools and complexes. This design, coupled with their old greywater unit, would reduce consumption by up to 80 percent per month.

AquaRenu is currently working with contractors in Mpumalanga and installing their greywater units in some of the local schools in the area. To date, their clients have been homeowners in Cape Town and Johannesburg.

The students have received overwhelming media attention and now the challenge will be to secure a vehicle for the business so that they can deliver on all the orders.

Greywater conceptual output

#saving water in Chemical Engineering

In the bathrooms of Chemical Engineering you will find 25-litre water containers which have captured water from the outflow pipes of machines that you find in the laboratories. The water is clean and used to go down the drain pipe. Now it can be used at the basins to wash hands.

L.E.A.D. café inaugural event

Avela Kunene, an EBE postgraduate student council member who held the transformation portfolio in 2017, was the person behind the first L.E.A.D. café event. Avela is passionate about encouraging young black South African students into postgraduate studies and research careers and hopes they will be convinced to consider academia as a career. She said, “L.E.A.D. stands for Learn Engage Activate Develop, and this is what I want to bring across to the undergraduate students. I want to empower students and invest in black talent and create a network of changemakers and leaders of industry.”

Avela Kuene handing Minister Naledi Pandor a bonsai tree to thank her for her contribution to the event

The Deputy Vice-Chancellor, Professor Mamokgethi Phakeng, addressed the students on the role they need to play to help transform the university. She said, “There is still work to be done in the university to make the space welcoming and inclusive for everyone so everyone can stay and feel it is their place. If you don’t think it is your responsibility to help transform the place, then it will not transform.”

The inaugural event was privileged to have Minister Naledi Pandor as the guest of honour. She acknowledged the transformation made in the higher-education sector in South Africa since 1994, as well as the need for fundamental change experienced in the past two years. Below is an excerpt from her talk.

"We have had a remarkable increase in black participation, black enrolment, and gender equity. There has also been considerable investment in institutional recapitalisation and in new infrastructure across the system, including student accommodation and two new universities," Minister Pandor said.

However, the severe lack of engineers impacted negatively on the country's infrastructure maintenance and development plans for water, sanitation, roads, airports, railways, and electricity.

One of the government's solutions is to build institutions that could employ young engineers and technologists.

The Council for Scientific and Industrial Research (CSIR) is the biggest and best-resourced science laboratory complex in the country, accounting for 15% of government expenditure on research and development. Recently, the council adopted water sustainability, health, and safety and security as areas of integrated research and innovation.

The minister said that South Africa's young scientists and engineers had played leading roles in many of the areas of building the Square Kilometre Array (SKA), with skills imparted by universities and expertise from SKA partners outside the country.

The minister warned that these positive indicators should not result in the neglect of a number of important tasks in achieving transformed engineering capacity in South Africa. One of the challenges is to increase innovation by both the public and private sectors.

“We need engineers that are skilled in developing new ideas and new products. We need professionals with postgraduate research training able to lead innovation, to lead research teams and research institutions. This requires black and women academics in all universities and engineering faculties," she emphasised.

The Dean, Professor Alison Lewis, used the analogy of a forest to get her message across about how important it was to create a community where everyone works together and supports on another. She said, “The faculty prides itself on the nourishment, sustenance and nurturing that we provide to our students. We also pride ourselves on the quality of our graduates. Our mission is to produce knowledge, and professional graduates to make a positive impact in South Africa as well as globally.”

LEAD Café

Representing the youth at World Economic Forum

Shamiso Kumbirai, a 2012 UCT civil engineering graduate, has been selected to represent the voice of the Southern African youth at the World Economic Forum (WEF) in Davos in 2018.

Shamiso is a member of the World Economic Forum Global Shapers in Tshwane. Born out of the World Economic Forum, the Global Shapers Community is a network of inspiring young people under the age of 30 working together to address local, regional and global challenges. With more than 6 000 members, the Global Shapers Community spans 378 city-based hubs in 160 countries.

Every year the WEF selects 50 Shapers from across the world to come out and represent the voice of the youth and showcase the impactful work they are doing to change their local and international communities. In her capacity as a Water Engineer at Aurecon and her work with WomEng, Shamiso was selected. She said, "This is a wonderful opportunity to raise the need for infrastructure development on the African continent and advocate for the advancement of African women in STEM."

Shamiso is a water engineer with experience in bulk water supply and hydropower engineering across Africa. She works with the fundamental belief that the removal of water as a development constraint and the ability to harness this resource as a tool to help power Africa will positively change the lives of millions who call it home.

In addition to her love for sustainable infrastructure development, Shamiso is passionate about advancing women

Shamiso Kumbirai

in STEM. Since 2011 she has been involved with WomEng, a global organisation aimed at empowering the next generation of women in engineering, where she served as the Development Director in 2015. Through her work in the water sector and WomEng in 2017, she was invited to host proceedings at the African Sustainability Summit and is spearheading a Sani4Schools project aimed at improving the water and sanitation facilities for a no-fee school in the Mamelodi area with over 1200 learners.

She is currently pursuing her master's degree with the iCOMMS research team, focusing on participatory upgrades in large-scale water and sanitation infrastructure projects.

CEM's first-year community build

This year the first-year Construction Studies students' community build was out in Mfuleni, where CEM partnered with VHP Holdings to construct five BNG homes from foundations/floor slab to roof height. Members of the Association of Built Environment Students (ABES) were responsible for scheduling the work parties, overseeing the skills transfer from artisans to students. On the first day of the build, they were welcomed by Mr Thando Mguli, Head of Human Settlements in the Western Cape, and the CEO of VHP Holdings, Mr Sean Van Horsten. Hillary Faulmann of BlueMoon Project (previously Niall Mellon Township Trust) was the facilitator for the build.

On Day One, the students started building brick walls on two houses, and excavated trenches, poured concrete foundations and started construction foundation walls on another two houses. There were about 75 students on board, mostly first years (55) and senior students, with ABES committee members as group leaders.

2018 student councils

Postgraduate Student Council

Musa Salmamza	Electrical	Chair
Olakunle Alao	Electrical	Vice-Chair
Prospect Motsi	Civil	Secretary
Reuben Dlamini	Chemical	Treasurer
Thabo Mabuka	Chemical	Academic
Bonolo Skee	Chemical	Transformation & Outreach
Yandisa Sizamo	Electrical	International and part time
Avu Maake	Architecture	Corporate Liaison
Lelia Lelia	Chemical	Marketing and Events

EBE Postgraduate Student Council

Undergraduate Student Council

Chairperson	Ntokozo Mahlangu	Mechanical
Vice Chairperson	Thapelo Nthite	Electrical
Secretary General	Dancan Angwenyi	Electrical
Treasurer	Salusiwe Hlambelo	Chemical
Academic Chair	Chantelle Kee tui	Mechanical
Careers and Sponsorship	Helda Mandlate	Chemical
IT and Memorabilia	Tatenda Shuro	Electrical
Transformation & Student Life	Kamvelihle Tabata	Civil
Events and Marketing	Charlotte Musinga	CEM
Outreach and Publication	Napo Mochekoane	Civil

EBESC ENERGY. PASSION. PURPOSE.

Obituary

Mr Ruddy Bigabwa, a first-year Construction Management student passed away on 10 October 2017. Staff in the Department of Construction Economics and Management said Ruddy will be remembered as having a quiet disposition and for being friendly, really likeable and kind. He is described as a person who always had a smile on his face. The memorial service, which was attended by CEM staff and students, took place on 18 October. Ruddy was from the DRC, and his family members were supported by the Department of Student Affairs.

Philip Doubell , a MSc student in the Centre for Materials Engineering died in a motorcycle accident in Midrand on the morning of 27 October. He was part of the Eskom EPPEI programme. Staff in the Centre said, Philip's enthusiasm towards his research and his camaraderie with staff and fellow students will be sorely missed. Philip was always seen with a smile on his face and always willing to help anybody. He is survived by his wife and family.

Creating an inclusive EBE

Through out the year, the Faculty with the help of the EBE undergraduate student council, embarked on a number of activities to create an inclusive EBE.

- Engagement and Know your rights talks to students and staff
- Welcome the change and engagements – re-entering the space: surfacing what students and staff may be carrying over from 2016
- Creating inclusive classrooms – exploring with academics how to deal with anxieties, resistance to change and open-ness. Dealing with conflicting opinions and difficult situations
- Workshop with student councils to assist them with dealing with conflicting opinions and allowing all voices to be heard
- Enhancing student leadership with various workshops and interventions
- Movie nights – *DAMNation* and *Beyond the River* – with facilitated talks after the movies
- Topical discussions – dry sanitiation, water crisis – partnering with EWB and Future Water
- LEAD Café – transformation of the postgraduate student body
- Active citizenship programme - social Infrastructure course to expose more students to active citizenship by engaging with communities and exposing them to the challenges they face.
- EBE Decolonisation sessions x 3 (EBE student Council)
- Engagement on fee-free education
- Ongoing discussions and engagements in the departments
- Student in Distress Fund
- Transforming EBE" discussions. The focus of this session was on highlighting instances where we believe we have been able to develop courses that are locally relevant as well as globally excellent.
- APG's Open Classrooms
- Talk on Mental Health issues

The refurbished Menzies Building's furniture is slowly being delivered. The rest will be delivered over the next two weeks.