Alumni INGligting

2017

November

Newsletter: Faculty of Engineering/Nuusbrief: Fakulteit Ingenieurswese
Universiteit Stellenbosch University
Issued by the Dean: Engineering/ Uitgegee deur die Dekaan: Ingenieurswese
Editor/Redakteur: Liesel Koch, lkoch@sun.ac.za

Alumni in Gauteng meet new Dean

The Faculty of Engineering hosted a very successful coctail event for Matie engineers on 19 September at the Balalaika Hotel in Sandton with some 80 alumni attending. The purpose of the function was to introduce the new Dean, Prof Wikus van Niekerk, and to give alumni the opportunity to build or strengthen business networks and reconnect with their class mates. It was interesting to note that about two-thirds of the guests comprised the "younger" generation of 40 years and below.

In his presentation, Prof Van Niekerk expressed his high regard for the Rector, Prof Wim de Villiers, he shared recent news, student growth and successes as well as the campus renewal project at the Engineering building complex.

He concluded: "The Faculty of Engineering at Stellenbosch is well-positioned to deliver graduates, research outputs and services to stimulate economic growth and improve the quality of life for all South Africans. Our graduates and staff remain world-class and can compete with the best in the world. We have some challenges that we need to prepare for, especially concerning the current funding model of universities and general student unrest in the country."

Dr Annie Bekker, one of the Faculty's young, dynamic academics, gave a presentation on her interesting research project *The SA Agulhas II - from big data to insight*. Thereafter the alumni and Faculty personnel had a great evening chatting and enjoying delicious snacks and Stellenbosch University's excellent *Die Laan* wine.

Photographs taken at the function can be viewed at https://rocketphotography.shootproof.com/gallery/FOE/

Faculty of Engineering personnel who attended the Alumni function in Gauteng were top left Prof Wikus van Niekerk (Dean) and the row just below from the left Prof Willem Perold, Vice-Dean Research (addressing the audience), Liesel Koch (Engineering Corporate Marketer) and Dr Annie Bekker (academic, Mechanical and Mechatronic Engineering) who shared her research project.















Profiel: Prof Fred Hugo

Vyf loopbane in ses dekades

Vyf loopbane in ses dekades! Dis deel van die interessante verhaal van die 82-jarige prof Fred Hugo wat in 1995 ná 'n akademiese loopbaan van 17 jaar "afgetree" het, maar 22 jaar later steeds op verskeie vlakke as kundige in sy vakgebiede bedrywig is.

Vandat hierdie besonderse siviele ingenieur in 1958 gradueer het, was hy aktief betrokke in die konstruksiebedryf, het ontwerp en toesig gedoen, en as raadgewende ingenieurspraktisyn gewerk. Hy het ook vir 17 jaar 'n produktiewe akademiese loopbaan beoefen en terselfdertyd as entrepreneur en diagnostiese ingenieurspraktisyn uitgestyg.

Prof Hugo is 'n leier op die gebied van versnelde toetse op padplaveisels. Dis gedoen met die veelbekroonde, gevorderde mobiele wiellassimuleerders vir plaveiseltoetsing op verskillende skaalgroottes, wat hy as mede-eienaar van MLS Test Systems (Edms) Bpk ontwikkel het en wêreldwyd suksesvol bemark het. Verder was hy die stigter van die Fakulteit Ingenieurswese se grootste uitreikprogram, TRAC SA, wat ná 23 jaar steeds van krag tot krag gaan.

Die MLS66, vyfde in die reeks van volskaalse mobiele lassimuleerders, het 24 Maart vanjaar per skip in Nanjing, China, aangekom. Johan Müller (voor regs) is besig om dit met afstandbeheer af te laai.

Die jong Fred het op die Oos-Rand grootgeword. Sy vader, wie se skoolloopbaan tydens die Eerste Wêreldoorlog kortgeknip is, het 35 jaar lank op die myne gewerk. Hy sê: "My Pa was een van my rolmodelle. My fondament vir werksetiek is deur hom gelê. In sy diens van 35 jaar op die myne was hy slegs twee dae afwesig! Hierop is voortgebou deur my wiskunde onderwyser, mnr Geldenhuys, wat 'n landmeter was wat die klem op 'n tegniese loopbaan geplaas het en vir my studieleiding gegee het. Dit het die tafel gedek vir my ingenieursloopbaan."

Fred Hugo se studierigting is gedeeltelik ook deur sy vader se beroep beïnvloed. Hy sê hieroor: "Die Kamer van Mynwese het 'n beurs aan my toegeken op grond van my Pa se diens aan die mynwese en my aanleg om ingenieurswerke te kan uitvoer soos ek bewys het deur vakansiewerk by konstruksiefirmas."

In 1958 behaal hy sy eerste graad in siviele ingenieurswese by Wits, gevolg deur 'n MIng *cum laude* aan die Universiteit van Natal in 1969 en 'n PhD by die Universiteit van Texas te Austin in 1984.

Sy professionele loopbaan skop af in 1959 toe hy vir sewe maande in Switserland werk as lid van Rand Earthworks, 'n Switsers-verwante firma. Met sy terugkeer was hy ten volle verantwoordelik vir voortgesette projekte waaronder die Yskor Vanderbijlpark slakverwerkingsaanleg en reduksiewerke van 'n nuwe aanleg vir Western Deep goudmyn te Carletonwille. In 1961 sluit hy aan by Van Wyk en Louw Raadgewende Ingenieurs (nou Aurecon) as resident ingenieur van Krokodilbrug met Ferdie Heymann as mentor. Daarna was hy verantwoordelik vir ontwerp en toesig oor konstruksie van lughawe plaveisels (Kimberley en Jan Smuts). Die volgende fase van sy loopbaan begin in 1965 as medestigter van BKS & H (nou AECOM) waar hy as die "H-vennoot" fokus op uiteenlopende projekte in Geotegniek, Vervoerwese en Projekbestuur. Van die projekte het ingesluit diep kelders, fondamente van hoë geboue asook ontwikkeling van lughaweprojekte. (Laasgenoemde behels die terreinkeuse en grondwerke van die nuwe Koning Shaka lughawe by Durban).

In 1978 wink die akademie hom nader as professor in Geotegniek, Vervoerwese en Projekbestuur by die Fakulteit Ingenieurswese, Universiteit Stellenbosch. Sy navorsing toe was gerig op plaveisels, diagnostiese geotegniek en materiale. Vanaf 1987 werk hy boonop deeltyds by die Universiteit van Texas. Ná sy aftrede in 1995 gaan hy egter voort by die US op kontrakbasis.

"My vyfde loopbaan, die van entrepreneur en diagnostiese ingenieurspraktisyn, het in 1992 begin toe ek saam met 'n Matie ingenieur en briljante vennoot, Johan Müller, 'n plaveiselingenieurspatent (Mobiele Lassimuleerder, ofte wel MLS) ontwikkel het wat versnelde toetse op padplaveisels kon uitvoer. Daar was nie akademiese belangstelling in die patent nie en ek en Johan het verder op die MLS as primêre produk gefokus. Die Texas padowerheid het 'n skaalmodel van die MLS gekoop om die metodiek te verken en die owerheid het daarna besluit om die vervaardiging van 'n volskaalse masjien te borg. Dit is vyf jaar vir navorsing benut en daarna tydens opgradering geskroot ten spyte van 'n aanbod deur 'n universiteit om dit oor te neem sonder vergoeding vir verdere navorsing."

'n Derde-skaal MMLS3 is daarna in Suid-Afrika vervaardig en wêreldwyd versprei. In 2007 is die eerste nuwe volskaal MLS in SA vervaardig vir gebruik in 'n gesamentlike navorsingsprojek in Mosambiek tussen Suid-Afrikaanse ingenieurs en ingenieurs in Austin, Texas, met borgskap van die Wêreldbank. Die prototipe is toe na 'n verdere proeflopie in Zürich deur 'n konsortium onder leiding van EMPA (Swiss Federal Laboratories for Materials Science and Technology) gekoop. Dit was die begin van die reeks van volskaal-modelle.

Vandag is daar 30 MLS-modelle wêreldwyd. Die intellektuele eiendom van Müller en Hugo is in 2014 aan 'n Britse maatskappy, Pave Testing, verkoop met verpligting om bystand vir 'n bepaalde tydperk te verleen met produkte wat deur die nuwe eienaar gelewer word.

Behalwe vir sy reuse aandeel in die vestiging van TRAC SA (Sien volgende artikel) het prof Hugo ook op vele ander gebiede diep spore getrap. As lid van die Transportation Research Board (TRB) in Washington vir 20 jaar het hy onder andere op drie van die vaste komitees gedien, naamlik onderwys en opleiding, plaveiselnavorsing, en bitumineuse materiale. In Suid-Afrika dien hy op soortgelyke wyse in vakkomitees en word in 1993 verkies tot president van die SA Instituut vir Siviele Ingenieurswese (SAISI).

Hy sê: "SAISI se Raad het in 1990 'n taakgroep saamgestel vir die ontwikkeling van 'n 10-jaar aksieplan om menslike hulpbronne vir tegnologie te bevorder. As lid van die uitvoerende komitee van SAISI was ek deel van die tegnologiese span wat die plan, later bekend as THRIP (Tegnologiese Menslike Hulpbronne vir die Nywerheid Program), oor 'n periode van drie jaar tot suksesvolle implementering ontwikkel het. In die proses het ek saamgewerk met mense en instansies soos

Prof Fred Hugo en Johan Müller by 'n uitstalling van die Departement Handel en Nywerheid in Bloemfontein in 2008.

Vervolg op volgende bladsy. ↓

prof Roy Marcus, president van die SA Vereniging van Ingenieurswese (SAVI) (nou die SA Academy of Engineering oftewel SAAE), Cliff McMillan, vennoot van ARUP wat namens SAISI en SAVI opgetree het, dr Reinhard Arndt, president van die Stigting vir Navorsingsontwikkeling, dr Marius de Waal, tussentydse voorsitter van THRIP, asook met die Ekonomiese Adviesraad van die Staatspresident. In 1993 het dr Arndt my skriftelik ingelig dat befondsing deur die Departement Handel en Nywerheid (1993/94) voorsien is op voorwaarde dat die privaatsektor op die grondslag van R2 tot R1 staatsfondse moet bydra. Sedertdien het landswye tegnologiese menslike hulpbron instansies oor die jare honderde miljoene rande in THRIP-befondsing vir navorsingsprojekte ontvang."

Nog een van die "monumente" wat hy nalaat, is die Konstruksiebestuursprogram (Construction Management Programme, CMP). Dit is in 1976 deur die inisiatief van die SA konstruksiebedryf (SAFSEC) geloods. Ná Prof Hugo se toetrede in 1980 en die eerste aanbieding in 1984 in Stellenbosch, het hy as leier die CMP vanaf 1987 in Stellenbosch in samewerking met die SA konstruksiebedryf en 'n bestuurspan deurlopend in Stellenbosch aangebied. Dié program lei middelvlak bestuurslui op en vele van die alumni van die program beklee vandag poste in die hoofbestuur van groot maatskappye. Die alumni het gegroei tot meer as 1 500. In 2012 het prof Jan Wium die leiding van die CMP oorgeneem.

Van die hoogtepunte in prof Hugo se loopbaan is: 'n Goue Medalje van die Akademie vir Wetenskap en Kuns (2005), sy verkiesing as president van SAISI, verskeie nasionale en internasionale toekennings, en die graad DIng (1998) vir sy leiding met die ontwikkeling en aanwending van die MLS-tegnologie. Dit het gelei tot die ontwikkeling van die Texas Lassimuleerder (TxMLS) vir lading van plaveisels teen versnelde tempo onder verskeie toestande. Dit het bygedra tot die erkenning van hom as een van die mees ervare navorsers op dié gebied en tot wêreldwye erkenning van gevorderde plaaslike navorsing. In 2014 word die kroon op sy loopbaan gespan toe die US 'n eredoktorsgraad DIng, *honoris causa*, aan hom toeken vir sy omvangryke bydrae tot innovasie en vooruitgang in die Suid-Afrikaanse en internasionale siviele ingenieursbedryf, en sy onwrikbare verbintenis tot vermoëbou in die beroep deur ontwikkeling van ander bestaande en toekomstige bedryfsleiers. Hy is in Oktober vanjaar ingelyf as eregenoot van die Suid-Afrikaanse Akademie vir Ingenieurswese.

Fred en Marie langs die Rockies by Steeples tydens 'n besoek aan Kanada in 2016.

Nog steeds is hy baie bedrywig. In Junie was hy in China waar hy 'n dosyn lesings regoor China gelewer het en die loodsing en ondertekening van die "World Transport Convention Alliance (WTC)" op uitnodiging in Beijing bygewoon het. Tydens die besoek, is hy aangestel as deskundige konsultant van binne Mongolië.

By die huis staan hy sy plek vol as eggenoot, vader en oupa. Hy en Marie, saam met wie hy op skool was, is 60 jaar getroud. "Sy was 'n onderwyseres totdat my dinamiese loopbaan my werkplek bepaal het en haar hoofrol verander het na die van gesinsversorger en een wat diens aan die gemeenskap lewer. Later was sy my wêreldwye reisende ondersteuner wanneer moontlik. Ons het vier kinders en agt kleinkinders. Eldaleen is die laaste tien jaar die redakteur van *Vrouekeur*, Paul is 'n uitstallingsargitek in die Kaap en Duitsland, Danie is 'n ginekoloog in Kanada en Frederick is as vakkundige reeds die afgelope 18 jaar verbonde aan TRAC SA waar hy tans die nasionale hulpbronbestuurder is."

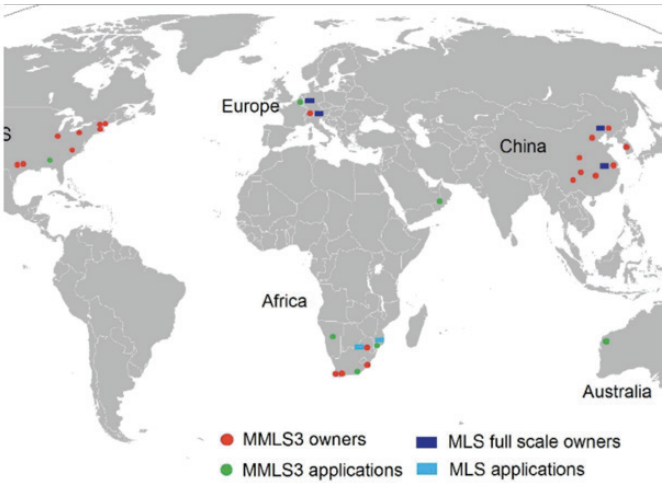
Wat sy stokperdjies en belangstellings betref, staan klassieke musiek en diagnostiese speurflieks voor in die ry. Die lekkerste ding op aarde is vir hom die verkenning van die heelal.

Die Hugo-egpaar se kinders van links: Danie, Paul, Eldaleen en Frederick.

Prof Hugo sê: "In my lewe het alles op mekaar gebou en het ek dit as trapklippe na die volgende fase gebruik. Oor my hele loopbaan het ek fantastiese mense uitgesoek om mee saam te werk, want dit was vir my uiters belangrik om binne my vermoë opvolgers agter te laat om die werk verder voort te sit en verder uit te bou.

En hoe sou hierdie man van vele talente homself kortliks opsom? "Moeilike taakmeester!" antwoord hy sonder aarseling.

Afgevaardigdes by die World Transport Convention wat Junie vanjaar in Beijing plaasgevind het. Agter heel links is prof Fred Hugo.



Verspreiding van die globale mobiele lassimuleerders (MLS)-groep.

TRAC SA - Eradicating poverty and changing lives

TRAC South Africa, a national, non-profit intervention programme of Stellenbosch University (SU) that provides support in Physical Sciences and applicable Mathematics to learners in disadvantaged communities, is going from strength to strength. It was started in 1994 and has been a flagship programme of SU since 2008.

TRAC was initiated in the United States many years ago as a hands-on outreach programme of the American Association of State Highway and Transportation Officials (AASHTO) promoting careers in transportation engineering.

As early as 1993 Prof Fred Hugo and likeminded colleagues investigated the shortage of engineers, technologists and artisans in the South African economy. During a visit to the USA that same year, Prof Hugo met with the manager of TRAC USA, Alan Shute, where they were able to discuss their visions for the establishment and development of a regional and autonomous TRAC programme in South Africa.

The launch of TRAC South Africa in 1994 was with a single TRAC PAC that was purchased and one Apple Mac computer that had been given to Prof Hugo during his visit to Washington D.C. In Stellenbosch, the TRAC Lab was established as an entity within the Institute for Transport Technology in the Department of Civil Engineering. The latter had the benefit of linking to the academic institution and having student interns that could serve as mentors to learners using the TRAC computer and system.

Since coming to South Africa, the programme has undergone some dramatic changes and grown from a single TRAC PAC, to a programme with nationwide facilities. At the same time as growing physically, the programme has adapted to meet South African skills needs.

Today this programme is operational in 22 areas within 6 provinces of South Africa. Facilitators engage with more than 15 000 learners in 110 secondary schools on a daily basis.

In 2016, TRAC recorded 668 822 formal exposures in its 22 laboratories located nationally. The reach has expanded exponentially since 2005, when 26 619 exposures were recorded.

Improving learners' performance

The focus is on improving learners' performance in Physical Sciences through curriculum-based academic learner intervention. In 2014 and 2015, the national pass rate of TRAC's participating Grade 12 learners in Physical Sciences was 64,1% and 65,2% respectively. In 2016, this pass rate increased to 70,6%. In 2016, the Department of Education's national pass rate for Physical Sciences was 62%. This statistic (of the Department of Education) includes all schools in the country, whilst TRAC works exclusively in disadvantaged, poor schools.

Great emphasis is placed on informing, encouraging and assisting learners to enrol at tertiary institutions and the number of learners venturing into tertiary studies has shown consistent growth. In 2017, 1 760 TRAC learners registered for first-year tertiary studies.

In November this year, TRAC SA was the recipient of a Gold Award from the Impumulelo Social Innovations Centre. From the left: Adv. Sibonile Khoza (Chair: Impumelelo Social Innovations Centre), Debbey Olivier (Executive Director: TRAC SA), Ian Moodie (Director of Molteno Brothers Trust), Patricia Dube (Regional Manager: TRAC SA), Lisle Svenson (Chair: Distell Development Trust), Frederick Hugo (Resource Manager: TRAC SA), Joseph Dube (Learning Manager: TRAC SA) and Godwin Tafirei (Learner Facilitator: TRAC SA).

Funding

The TRAC approach is to make computer-based technology and curriculum relevant content available to learners and educators throughout South Africa. To achieve this, TRAC SA relies on partnerships for donations. In 2016, TRAC SA received nearly R14 million in funding from a range of external funders whilst Stellenbosch University provides facilities and services to the TRAC programme.

Awards

In 2008 TRAC received an NSTF award for an outstanding contribution to science, engineering and technology in the category for Non-Governmental Organisations (NGOs) and Community-Based Organisations (CBOs). In 2008, Ms Debbey Olivier (Executive Director) received recognition from Stellenbosch University for excellence in community service. In 2015, she was a recipient of the coveted Chancellor's Award at the same institution. In November this year, TRAC was also a recipient of a Gold Impumelelo/Distell Award from the Impumelelo Social Innovations Centre.

Ms Olivier says: "TRAC strives for excellence and integrity in all its endeavours, whilst opening up opportunities to the young people of this country that help learners on their way to becoming valued citizens in meaningful positions. The programme is instrumental in redressing inequalities of the past offering opportunities to the most disadvantaged communities in South Africa and thus changing lives."

Prof Fred Hugo, previous Director of TRAC SA, is pleased about the great progress made over the past 23 years: "I believe that the elevation that has been reached by TRAC is at an exceptional level from where the high mountains can now be climbed to new levels above expectation previously envisaged!"

The current Director of TRAC SA, Prof Jan Wium, has great admiration for the personnel involved in the TRAC programme: "I am touched by the successes in figures, but more so by the difference the programme makes in the lives of individuals. This can only be achieved through a personal commitment by each staff member. Whilst educational support is most important, I have noticed that the personal interaction with learners and the spirit in which this takes place, are the real contributors to provide learners with hope and with vision. A hope and a vision to set them on a path from where they can build a future for themselves."

Most TRAC learners come from severely challenged socio-economic backgrounds and do not have financial means to further their academic careers past Grade 12.
TRAC SA, through active collaboration with about 130 bursary companies, has managed to successfully facilitate bursaries for the number of learners depicted on the right.

Number of students receiving bursaries

2010	2011	2012	2013	2014	2015	2016	2017
56	107	164	297	386	405	628	819

Read two success stories on the next page.

Two TRAC success stories

Three siblings benefit

Masixole Jarom from Uitenhage heads a family, comprising himself, his brother and his sister. Their single mother passed away in 2006 when he was 16 and in grade 10. In grade 11 at Sisonke High School, he came across TRAC. Due to the help he received from TRAC during his grade 11 and 12 years, he performed very well. He obtained an A in Mathematics and a B in Physical Science, and was then accepted at the Nelson Mandela University (NMU) for a Diploma in mechanical engineering, graduating in April 2013. After completing his diploma, he registered for a BTech degree in 2013. At that time, he also received employment at the University's Renewable Energy Research Unit. While working on his second year BTech, Masixole received a number of job offers from various engineering companies. In April 2014, he took up employment as a service technician with Nordex Acciona Windpower, one of TRAC's financial partners.

Masixole's younger brother, Andile, also went through the same path of receiving much help from TRAC. Through TRAC's assistance he was able to obtain good results in grade 12. He went on to study electrical engineering at NMU, which he completed in June 2016.

While initially forced as a young child to head his family, Masixole is now able to do so as a responsible citizen with his own house, car and family (wife, daughter and younger sister). Inspired by his elder brother, Andile has followed suit, such that they are now both working for Nordex Acciona Windpower.

This family continues to excel. At the beginning of this year, Masixole had the privilege of visiting Germany through Nordex Acciona Windpower. This is something that is unthinkable for many in the community from which he comes. Their sister, Xabisa, is doing her first year of a Bachelor's degree in Sociology at NMU. Her studies are fully supported by her elder brothers. Masixole has recently been promoted within Nordex Acciona Windpower to assistant lead technician at the Kouga Wind Farm in Oyster Bay.

Masixole and Andile are ploughing back by mentoring TRAC learners in the areas where they work. During the Summer School, Andile visited the learners in the Bedford area, whilst Masixole left the learners at the Port Elizabeth Summer School inspired!

Ploughing back:
Mzomhle ploughing back by helping TRAC learners with Physical Sciences experiments at one of the TRAC vacation schools.

Contact:
Debbey Olivier
Executiver Director, TRAC SA
debbey@sun.ac.za
Tel: +27 21 808 4384

I will be a doctor very soon

Mzomhle Kiza lives in Mfuleni with his two sisters and his mother. His life has been a sad and exciting journey. Having been brought up in a shack by a self-employed single mother meant that he had to think and act like a grown-up from a young age.

He says: "I had to grow up and realize that the world does not owe me anything. I realized that if I wanted to break the cycle of poverty and strive towards a comfortable life I had to put God first. I knew that the only way I would get out of my situation was to educate myself — that would open a window of opportunity for us.

Mzomhle Kiza, the MBChB student.

"I remember after being enrolled at Manzomthombo Secondary School in 2008, my only goal was to pass matric and perhaps go to varsity one day. I was not sure what I wanted to study at that time or which university I wanted to go to. But I knew that university would one day be the best thing that could happen in my life.

"I cannot say I was always one of the smartest pupils in class, but after falling in love with Medicine in 2010 and discovering my passion for helping people, I knew it was time to quit playing games and put my books first. There were many academic challenges. The fact that I was in a township school meant that we struggled with a shortage of textbooks and stationery. Going to an actual science laboratory was a thing I could only dream of.

"In grade 11, I remember struggling with Science and Mathematics for the whole year. I was not getting good grades in either of the subjects. In 2012, I found myself in matric, worrying over the possibility that I wouldn't get in for medicine because of my Maths and Science marks. I remember my principal coming to my class one morning and he told me I was one of the students who were selected to attend TRAC's winter vacation school. At that time, I did not know what TRAC was. One afternoon the TRAC facilitator came to my school to explain how the programme worked. We were given a STACK of bursary forms to fill in. I have never liked admin stuff, but the TRAC staff had their way of making you fill in those forms.

"I went to TRAC's winter vacation school and met other pupils from other schools who came from similar backgrounds. After experiencing the practical approach to Science my love for Science began to grow. Then I remembered how excited I was after being invited to attend the TRAC spring vacation school as well. With my Science grades improving slowly but surely, I began to believe that perhaps I had a chance in getting into Medical school. Through TRAC's practical approach to difficult and challenging scientific concepts my Physical Sciences grades saw a drastic increase from 66,7% in June to 94% for my finals and I got in for medicine!

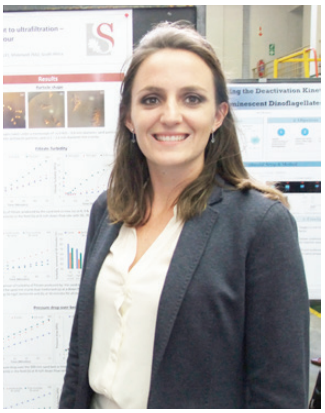
"Now I'm doing my 5th year in the bachelor of medicine and surgery at Stellenbosch University. I'm now currently on two bursaries thanks to TRAC for ensuring that I fill in those forms. I have also become good friends with some of the wonderful people I met in the TRAC programme. Once in a while we go to TRAC functions which I always look forward to. Somehow, we have become part of the TRAC family.

I know I still have a long way to go. I still live in the same shack but I look to the future with faith, hope and trust that the Lord will carry me through and help me to one day reach my destiny. That is my dream, and every day I'm grateful because I was given the opportunity to make my dream come true."

Internship programme - all parties benefit

"When I recently met final-year Chemical Engineering student Heather McGinn, I was impressed by her maturity and self-confidence. To me it seemed to be at a higher level than the average student," says Liesel Koch, corporate marketer at the Faculty of Engineering. "As I am very interested in people, I decided to snoop around to find out more about her. I discovered that Heather participated in the Department of Process Engineering's Internship Programme last year. This made me wonder about the programme itself, as well as the benefits it has for interns, for instance possibly boosting their confidence."

This optional internship programme has been available for third-year Chemical Engineering students since 2016. After passing their third-year, students have the choice to do an internship at a company for a year, before returning to Stellenbosch to complete their final year.



Heather McGinn.

Prof André Burger, coordinator of the programme at the Department of Process Engineering, says: "Medical students are trained in academic hospitals, but engineering students do not have this opportunity to see the reality of industry. It is difficult to learn chemical engineering in practice if you are not in industry to experience it first-hand. The traditional six-week vacation training of students is much too short to get proper insight."

Prof André Burger.

The year-long internship provides a lot of advantages. Prof Burger elaborates: "With Engineering being a very demanding programme, some students sometimes need to experience a different environment and new challenges after completing their third year. During their internship, they are treated as adults and colleagues and not as students. They work under supervision and are exposed to work methods in industry where they do anything from practical work, document management or procurement. They have to spend 80% of their time out of the office and in a big plant. It takes them three to four months to find their feet. Interns 'grow up' very quickly; their common sense expands and they learn to think on their feet."

Prof Burger says the internship offers students an added bonus for their studies. "After being exposed to practical experience such as design, construction, plant operation and commissioning, intern students find final-year modules easier to grasp as they have now experienced it first-hand."

He concludes: "The internship programme delivers more mature, well-rounded graduates with more insight, which makes them more marketable to industry."

When asked why she had opted for the internship, Heather McGinn said: "To gain experience, and it was a job that landed in my lap." She did her internship at Veolia Water Technologies in Modderfontein, Johannesburg.

One of the things the she really enjoyed, was being treated as an equal. "I was very surprised to see how relaxed it was in industry. They are on a first-name basis and I was treated as an equal. However, you have to set your parameters immediately otherwise you will end up doing somebody's filing. I was determined not to fall into that trap.

"My work involved basic and detailed design of a desalination plant processing 6 million litres of seawater an hour and spent a lot of time doing pre-commissioning and commissioning. The most interesting was learning something in industry before learning it in class. I also did a lot of engineering work, such as mechanical and electrical, that was not in my scope. I had to take over where others had left off and had to take a lot of time researching and asking for advice."

However, coming back for her final-year studies was not so easy. "It was difficult to get back into studying. Furthermore, I did not know anybody in class. In Engineering, you rely on your class mates and I struggled to get back into it. While doing an internship, you work eight hours a day, while studying, you have lectures during the day *and* have to study at night. Still, I will definitely opt for the internship if I had to choose again."

She says she would really recommend the internship programme to other students. "Over and above the important experience, I also made valuable connections with people."

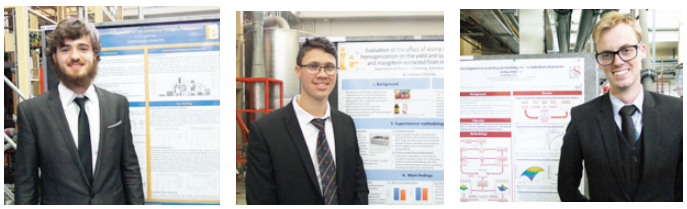
Heather concludes: "I liked that I could go and work in Johannesburg. I would strongly suggest to other interns to go as far as possible from your known area and environment. When you are in a new place, it forces you to have new experiences and meet new people, broadening your life skills."

Students whose performance is such that they will graduate in four years, can apply for the internship in their third year. About 5 to 10% of chemical engineering students do the internship programme at companies that have been selected by the Department of Process Engineering. Students are paid by the companies, but they are responsible for their own transport and accommodation.

Wimpie van der Merwe, Technical Director at Proxa Pty Ltd, a company that takes in interns, says: "The intern programme gives us the opportunity to work with students who have largely completed their theoretical training. As such they are able to communicate meaningfully with engineers in practice, while we are also able to apply them productively. Our experience the past two years has been that students adapt quickly and are hungry for practical experience. In all the cases, we had the privilege to work with students who ended up being more mature at the end of their time with us. For us it is a very constructive experience. It gives our senior engineers the opportunity to practise their mentoring skills, while our junior engineers work well with the students. We would like to continue with the programme."

Dale Gyure (Head of Implementation - Strategic Development) at the National Bioproducts Institute (NBI) located in Durban, says; "The internship experience at NBI offers in-depth exposure to process engineering within pharmaceutical manufacturing – a highly regulated industry. In the previous two years, Rowan Richards and Teunis Schlebusch from Process Engineering were awarded the internships and gained experience with various pieces of pharmaceutical process equipment including ultrafiltration and CIP skids, automated integrity testers and plasma pack handlers, chamber bowl centrifuges, air handling units and sanitary tanks. At NBI interns flourish under the mentorship and guidance of more senior process engineers and project managers within the company, but are also expected to work independently as they progress through the one-year programme.

"Rowan and Teb both found the internship highly beneficial in applying university training to real-world practical problems. NBI manufactures blood plasma-derived therapies by a combination of process scale protein biochemistry, traditional purification and refining operations employing familiar chemical engineering unit operations and aseptic fill and finishing of both liquid and freeze-dried products. NBI is looking forward to our third intern due to start in January, 2018."



Other 2016 interns here at the final-year poster presentation day on 15 November 2017 are from the left Louis Lochner, Rowan Richards and Allistair Border.

Faculty news snippets

Prof Sampson Mamphweli.

In July, Prof Sampson Mamphweli took over as new Director of the Centre for Renewable and Sustainable Energy Studies (CRSES), based in the Faculty of Engineering. Prof Mamphweli hails from Vuwani in Limpopo. He studied Environmental Science (undergraduate, honours and master's) at the University of Venda, and obtained a PhD in the field of biomass gasification from the University of Fort Hare.

After completing his PhD, he started working at the University of Fort Hare as a researcher conducting research on biomass and solar energy projects. He was promoted to senior researcher and later to Associate Professor in the Institute of Technology at Fort Hare.

His main task as Director of CRSES will be to draw up a strategic plan for the Centre which includes research, marketing and collaborations.

Prof David Davidson, who has been with the Faculty of Engineering for 29 years, will retire early at the end of this year.

For the past seven years he was the incumbent of the SARChI-SKA Research Chair in Engineering Electromagnetics.

Currently he is the researcher with the highest NRF-rating (B1) in the Faculty.

Prof Davidson will be taking up a position at Curtin University, in Perth, Western Australia, as Director: Engineering of the Curtin Institute of Radio Astronomy (CIRA). He will also hold the Chair of Radio Astronomy Engineering at Curtin University.

Prof David Davidson.

The Faculty of Engineering does its utmost to recruit the best students as its programmes are extremely challenging and demanding. For this reason the Faculty has a personnel member dedicated to student recruitment and retention, August Engelbrecht (photo back far left). Over a period of more that ten years he has launched several recruitment initiatives with great success. One initiative, which aims at increasing the diversity in the Faculty, is a telethon where current black engineering students phone black prospective students and tell them in their mother tongue about their positive experience as a Matie engineering student. On 18 October the 12 students on the photograph phoned more than 100 prospective students talking to them in nine ethnic black languages.

Currently about 30% of the Faculty's undergraduate students are black, coloured, Indian or Asian.

Die Fakulteit moes die mite dat Ingenieurswese slegs vir mans is die nekslag toedien en vroulike leerders bewus maak dat Ingenieurswese 'n uitstekende loopbaan vir vroue bied. Daarom word daar sedert 2003 'n Vroue in Ingenieurswese-middag gehou waartydens vroulike leerders, wat goed in Wiskunde en Fisiese Wetenskappe presteer, meer uitvind oor ingenieurswese as beroep vir die vrou wanneer vroue-ingenieurs, -dosente en -studente hulle toespreek.

Regs voor is Wendy Horn, skoolhoof by Protea Heights Academy, saam met 'n paar van haar skool se jong dames wat die geleentheid in 2017 bygewoon het. By dié skool moet alle leerders Wiskunde tot Graad 12 neem.