

Celebrating 75 Years of **Agricultural Engineering** at the University of KwaZulu-Natal



UNIVERSITY OF
KWAZULU-NATAL
INYUVESI
YAKWAZULU-NATALI

INSPIRING GREATNESS

**Agricultural Engineering at the
University of Natal/KwaZulu-Natal**

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**Message from the Dean of Engineering:
Professor Glen Bright**



Congratulations to the discipline of Agricultural Engineering, as it celebrates 75 years of higher education and research. The School of Engineering is proud to host the discipline that owes its success to students and staff (past and present), valuable stakeholders and technological advancements in Science and Engineering. Agricultural Engineering from the former University of Natal, now the University of KwaZulu-Natal (UKZN), has produced both human resources (graduates and postgraduates) and Agricultural Engineering technologies.

Outstanding staff and graduate Engineers have impacted Agricultural Engineering research, development and education worldwide. As an Engineering Council of South Africa (ECSA), internationally accredited degree programme through the Washington Accord in the USA, the School of Engineering looks forward to many more years of high-quality Agricultural Engineering graduates, postgraduates and research outputs.

**Message from the President of the South
African Institute of Agricultural Engineering
(SAIAE): Mr Pranesh Moodley**



On behalf of the South African Institute of Agricultural Engineers (SAIAE), I extend my congratulations to the discipline of Agricultural Engineering at UKZN on reaching its 75-year milestone. As a proud alumnus, I am inspired by the discipline's long-standing tradition of excellence and its role in shaping skilled, innovative graduates.

Over the past 75 years, UKZN has consistently produced Agricultural Engineering graduates who have made meaningful contributions to industry, government, and communities, both in South Africa and abroad. This legacy reflects the discipline's dedication to advancing Agricultural Engineering and supporting the continued growth of our sector.

I wish Agricultural Engineering at UKZN continued success in the years ahead and look forward to seeing Agricultural Engineering graduates from UKZN lead the way in making South Africa the recognised agricultural powerhouse of Africa through technological innovation, development and application.

Brief History of Agricultural Engineering

The Department of Agricultural Engineering at the University of Natal was established in 1948 when the Faculty of Agriculture at the University of Natal was formed. A Mr Geiger was the first lecturer appointed to deliver two service courses to Agriculture students and to act as a service engineer to the Department of Agriculture and to the Faculty. After Mr Geiger's resignation two years later, the Department gathered momentum under the late Professor Piet Vorster (also at one-stage Dean and later Deputy-director of the Water Research Commission), who established a five year degree in Agricultural Engineering with the first graduate (Mr C Stephens) in 1956. The five-year Agricultural Engineering degree programme was subsequently changed to a four year programme in 1968 to align it with the other engineering degrees at the University of Natal. To comply with the Professional Engineers Act, the Agricultural Engineering degree was transferred to the Faculty of Engineering in 1972, but the Department of Agricultural Engineering remained on the Pietermaritzburg Campus to facilitate links between the Agricultural Engineers and other agricultural disciplines. The Agricultural Engineering degree remains accredited by the Engineering Council of South Africa (ECSA) with the most recent ECSA accreditation visit undertaken in 2024.

Prof Vorster was promoted to become the first occupant of the Chair of Agricultural Engineering in 1960. The late Potgieter (Pottie) Meiring was appointed as a Lecturer in the Department in 1956 and he was subsequently promoted and appointed as Professor of Agricultural Engineering and as Head of Department in 1976 following Prof Vorster's appointment at the Water Research Commission in 1973. Prof Meiring was responsible for the development and expansion of the research programme in Power and Machinery, which became a leading, internationally recognised, tractor and fuels research centre. Peter Lyne (later Dr and Professor) joined the Department in 1977 and, together with Alan Hansen (also later Dr and Associate Professor) formed the core team with Prof Meiring in this centre of excellence.

Many students will fondly remember the mixture of congeniality, foreboding presence, high standards expected and incisive intellect of Prof Meiring. He always seemed to ask the difficult questions, did not tolerate barefoot students in his classes, and ruled the Department with an iron rod, ably assisted and organised by his secretary, Mrs Kay Temple.

Hydrological research in the Department of Agricultural Engineering started in 1974 under the leadership of Dr Jack Burney followed by the appointment of

Dr Roland Schulze in 1975, who has led hydrological research from 1976. Prof Schulze initiated the degree programme in Hydrology at the University of Natal in 1981. His focus, dedication, commitment and prolific research output resulted in a thriving, nationally and internationally recognised applied hydrological research group, now the Centre for Water Resources Research (CWRR).

Upon the retirement of Prof Meiring in 1991, Prof Schulze served as Head of Agricultural Engineering until Dr Peter Lyne was appointed as Professor and Head of Agricultural Engineering in 1993, a position he held until 2003. Prof Lyne forged strong links with the sugar industry and initiated negotiations with the South African Sugarcane Research Institute to fund a Senior Research Fellow in the School. He also initiated a research programme into optimising transport systems in the sugar and timber industries. Prof Lyne is still an Honorary Emeritus Professor with strong links to the discipline.

The restructuring of the University of Natal in 1999 saw the change in the name from the Department of Agricultural Engineering to the School of Bioresources Engineering and Environmental Hydrology (SBEEH), which formed part of the Faculty of Engineering. The growing demand for Agricultural Engineers, accompanied by the name change to reflect the strengths and activities of the SBEEH, and the availability of bursaries, resulted in double the number of undergraduate Agricultural Engineering students. Similarly, there was a growing demand in the country for qualified hydrologists, particularly those with postgraduate qualifications.

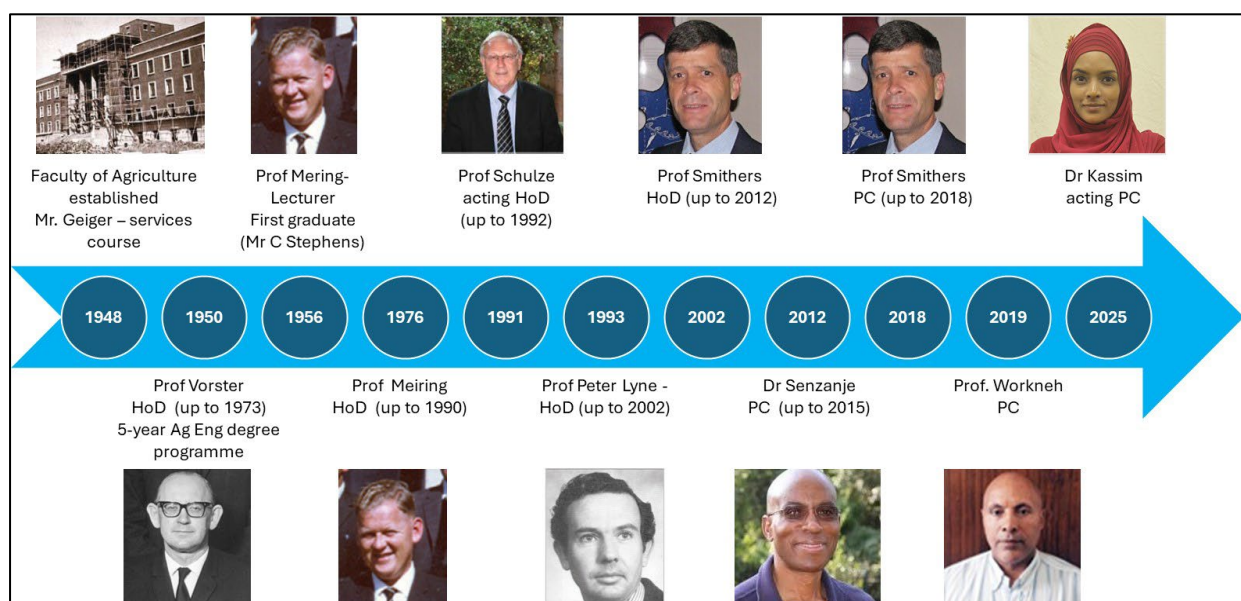
Prof Jeff Smithers was appointed Head of SBEEH in 2002 and Professor of Agricultural Engineering in 2004. During his tenure, the School grew in terms of staff and student numbers. He motivated for and secured both a Professorial Chair in Hydrology, as well as university funded academic and technical staff to sustain the delivery of the hydrology undergraduate programme, which had previously been dependent on contract research funded staff for the delivery of the programme in Hydrology. Following the retirement of Prof Schulze from the University in 2007, Prof Graham Jewitt was appointed as Professor of Hydrology in SBEEH.

As a consequence of the rationalisation of universities in South Africa, the University of KwaZulu-Natal was formed on 1 January 2004 resulting from the merger between the University of Durban-Westville and the University of Natal.

The strength of the SBEEH disciplines resulted in a vibrant and research-active school. However, the restructuring of the university in 2012 from Faculties into larger Colleges comprised of Schools, resulted in the Hydrology discipline

joining the newly formed School of Agriculture, Earth and Environmental Sciences and the Agricultural Engineering discipline remaining in the School of Engineering. This led to the formation of the Centre for Water Resources Research (CWRR) to facilitate water-related collaborative research from the two disciplines. Prof Graham Jewitt was appointed as the first Director of the CWRR up to his resignation from the university in 2019, and Prof Smithers has served as Director of the CWRR since 2019.

Within the School of Engineering, Agricultural Engineering was clustered with Civil Engineering, Property Development and Land Surveying and the cluster was managed by an Academic Leader reporting to the Dean and Head of the School of Engineering. The discipline of Agricultural Engineering remained on the Pietermaritzburg Campus. In the College model structure, Dr Aidan Senzanje served as the first Programme Coordinator (PC) for the discipline from 2012 to 2015, followed by Prof Jeff Smithers up to 2019 when Prof Tilahun Workneh was appointed.



Timeline of establishment and leadership of Agricultural Engineering

The History of the Ukulinga Research Farm

In 1950, the 500-acre farm 'Roblyn', which constituted part of 'Shortt's Retreat' just outside Pietermaritzburg, was purchased by the State for R64 000. It was aptly named Ukulinga (meaning 'to test' or 'to endeavour' in isiZulu). Adjoining land was later purchased, increasing the farm size to 356 ha. In 1973, it was transferred to the University with the proviso that it continued to be used for educational purposes. In March 1998, an agreement was signed between the Pietermaritzburg Msunduzi Transitional Local Council and the University, formalising the addition of 100 hectares of Ukulinga to the Bisley Nature Conservancy. This brought to fruition a vision of Prof. Frits Rijkenberg, then Dean of the Faculty of Agriculture, for the creation of a conservancy area that would provide the Faculty's Wildlife Science students with innovative and interactive training and learning opportunities.

Since its inception, Ukulinga has been the site of unique and ground-breaking research in several agricultural disciplines. Two of the world's longest-running ecological trials, the Veld Fertilisation Trial (VFT) and the Burning and Mowing Trial (BMT), were started in 1951 and have continued uninterrupted since then. The original objectives of the trials were primarily agricultural. Treatments in the BMT were designed to examine the influence of mowing moist tall grassveld at different times in summer, and removing the aftermath in winter by burning or mowing, on the yield and quality of hay. The VFT was designed to examine possible ways of increasing the yield of veld by fertilising with various elements. These trials are the focus of several internationally funded research projects aimed at examining ecosystem processes across continents. This approach epitomises the change from an agricultural focus many decades ago, to an ecological focus, which in turn feeds back into agricultural management.

The breeding of hybrid maize as well as the testing of all hybrid maize bred in the country before being released, have been carried out at Ukulinga. Furthermore, Dr Rob Melis initiated the first dry bean breeding programme for small-scale farmers in KZN from 1981 to 1990. The programme was sponsored by the De Beers Chairmans' Fund. The objective was to develop disease-resistant dry bean cultivars. This led to Melis establishing Pro-Seed in 1990, which is a private plant breeding business at Ukulinga research farm. Over three decades, Melis released more than 27 registered cultivars of dry bean, tomato and pepper. He developed the Ukulinga Sugar Bean variety (named for the farm), an easy-to-harvest sugar bean and an all-rounder adapted to most bean production areas.

Horticultural research on many kinds of fruits and nuts, including the release of the scab-tolerant 'Ukulinga' pecan nut cultivar and 'Honey Gold' female pawpaw, the oldest pawpaw clone in the world, has also been undertaken at Ukulinga.

In the 1960s, George Hunter conducted revolutionary research that involved the use of rabbits as intermediate living incubators to transport fertilised ova from ewes in England to South Africa, where they were successfully transferred into local surrogate ewes. The result was the birth of twin lambs, Romulus and Remus, now immortalised in an ornate clock created by John De Villiers as part of his Masters in Fine Arts dissertation, which now hangs in the foyer of the Rabie Saunders building. In 1995, another turning point in animal breeding was achieved when Africa's first test-tube calf was produced, involving the Department of Animal and Poultry Science.

Over the years, pioneering research in Poultry Science has been undertaken, and Ukulinga currently boasts internationally recognised facilities for poultry production. Prof. Rob Gous has been a pioneer in poultry research and an advocate for quality instruction and preparation of graduates. Work conducted at the state-of-the-art poultry facilities result in many publications on nutrition, reproductive physiology and modelling for broilers, layers and broiler breeders.

Agricultural Engineering is another pioneering discipline with workshops and laboratories established on the Ukulinga farm. These facilities have seen many final-year design projects being constructed and evaluated, and the development of many innovations by postgraduate students and staff. In addition to the mechanical manufacturing workshop, the Agricultural Engineering facilities includes power and machinery, food processing, electronics, irrigation, soil, and water laboratories all equipped with modern equipment and instrumentation to support the teaching of all undergraduate modules and postgraduate research projects.



Activities and facilities at the Agricultural Engineering Laboratories and Workshop at the Ukulinga Research Farm

Overview of the Agricultural Engineering Programme

The discipline of Agricultural Engineering is unique in that we are still currently the only tertiary institution in South Africa which offers an accredited qualification in Agricultural Engineering.

The Agricultural Engineering programme was historically structured to enable the first year of study to be completed on either the Pietermaritzburg or Howard College Campus (Durban). The second and third years were offered only at Howard College, where students took combinations of modules from Mathematics, Civil Engineering, Mechanical Engineering, Electrical and Electronic Engineering and Land Surveying. This was followed by students transferring to the Pietermaritzburg Campus with the programme focussing on Power and Machinery, Irrigation, Hydrology and a selection of Agricultural modules and culminating with the infamous Final Year Design Projects.

The Agricultural Engineering curriculum was revised and broadened in 2006 to include new fields (e.g. food processing and engineering, sustainable bioenergy systems, soil and water conservation engineering), while retaining traditional strengths in Agricultural Mechanisation, Irrigation and Hydrology. In addition, the scope and credit weighting of the Final Year Design Projects was expanded. This was facilitated by moving the third year of study to the Pietermaritzburg Campus. Thus, both third and fourth years of study are currently undertaken on the Pietermaritzburg campus, with only the second year of study completed on the Howard College Campus in Durban.

The Agricultural Engineering discipline has been purposeful about maintaining a high standard of both teaching (with ECSA accreditation of the Agricultural Engineering degree and recognition by the American Society of Agricultural and Biological Engineers - ASABE) and research, thus producing graduates who make significant contributions to industry, research and development. An Industry Advisory Board is convened annually to advise the programme and allow industry partners to provide input on the Agricultural Engineering programme and the performance of graduates in industry.

Highlights in the Agricultural Engineering programme for the students include "Brown Bag Lunch" (BBL) meetings, to which they invite Agricultural Engineering professionals external to UKZN to talk about professional work experiences. Students are required to interact and experience activities in industry through Vacation Work and Bioresources Engineering Practice Workshops. This includes visits to commercial farms, factories and other industrial sites to witness the processes for which they are being trained. The final year design project continues to be an important, albeit demanding,

highlight of the Agricultural Engineering programme, and allows students the opportunity to acquire hands-on experience in engineering designs, construction and the evaluation of their designs. The projects are frequently undertaken in collaboration and with support from industry. Their designs, mostly focussed on small-scale operations to keep the scale of the project manageable, are presented each year in October to industry, sponsors, staff and their fellow students at a KwaZulu-Natal branch meeting of the SAIAE.

The demographics of the discipline have changed over the years, with many more female students electing to study Agricultural Engineering. While the discipline must still combat misconceptions about exactly what Agricultural Engineering entails, it is the only Engineering discipline which provides technology to connect the living world of plants, soil, water and animals with the technology of engineering, i.e. systems, structures and machines.

The concerns related to food, water and energy security in South Africa, and the need for technology to sustain natural resources, has resulted in the increasing availability of bursaries for undergraduate students. The undergraduate student population has grown to approximately 100 students, with typically between 8 and 15 students graduating per year. Similar growth in postgraduate student numbers has also been experienced.

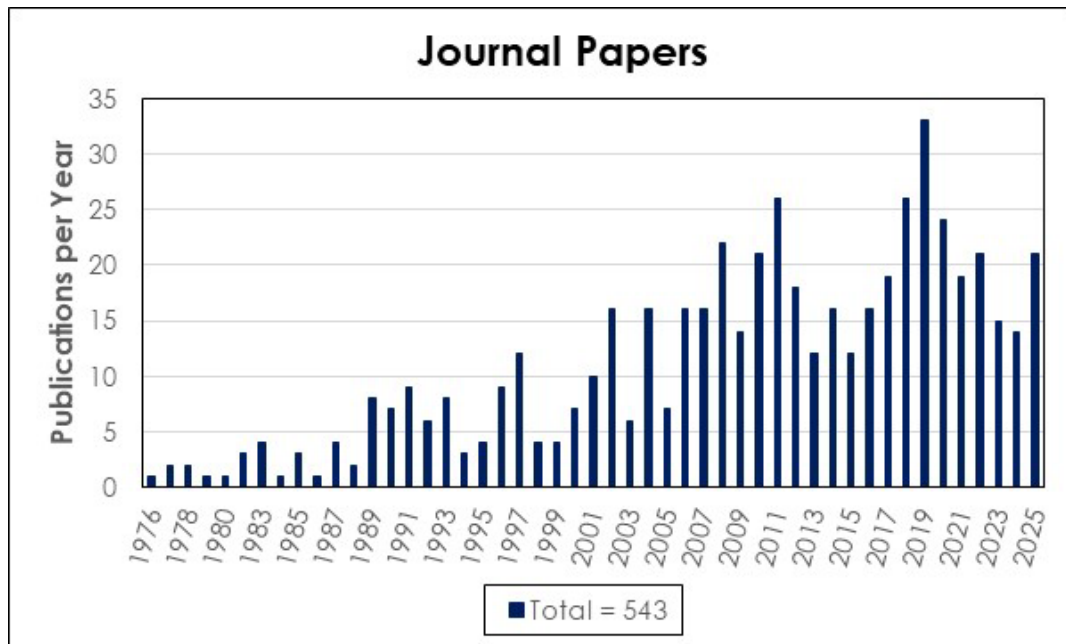
Overview of Research

Research undertaken by academics in the Energy, Food and Water Engineering Research Group in Agricultural Engineering is focused on a wide range of fields including: water use efficiency in irrigation, appropriate design and management of irrigation and drainage systems, increasing water productivity in agriculture, rural water supplies, sustainable energy, efficient supply chains in agricultural production systems, water resources and design engineering, flood studies, food engineering, food processing and post-harvest losses.

The discipline continues to have strong support from industry. This was initiated by Prof Meiring securing support from SASOL to investigate the performance of alternative fuels and their impact on diesel engine durability, and Prof Schulze securing contracts from the Water Research Commission to undertake hydrological field studies and model development. Significant contributions to support research have been made by many organisations, including the following:

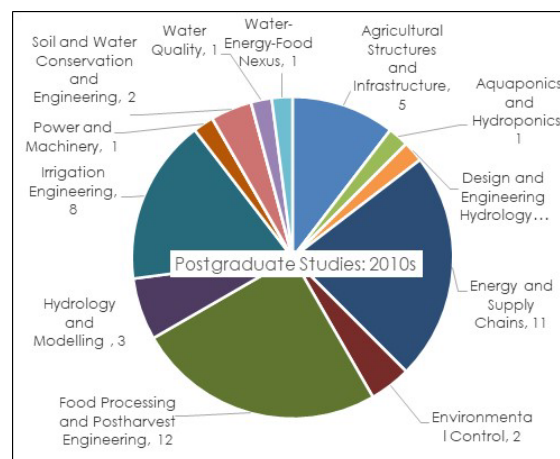
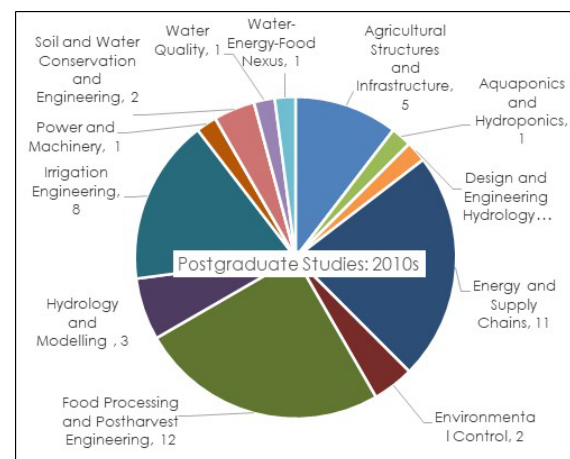
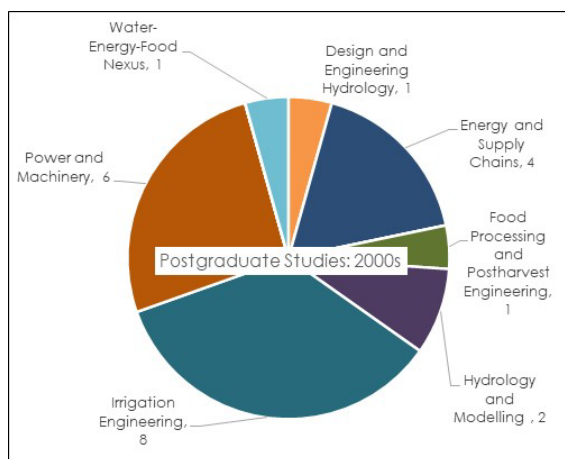
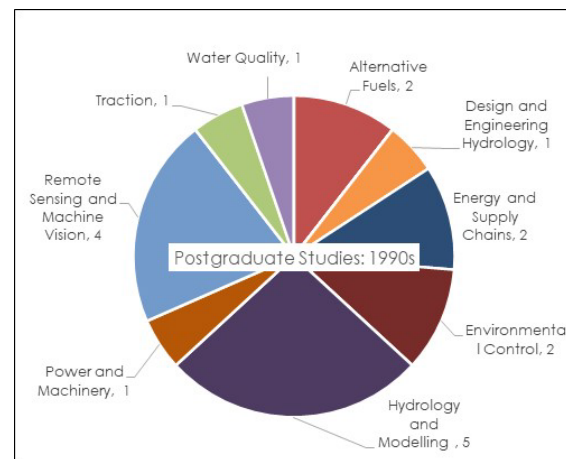
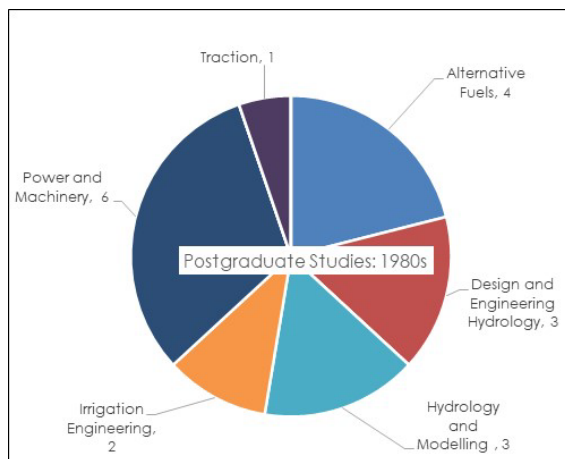
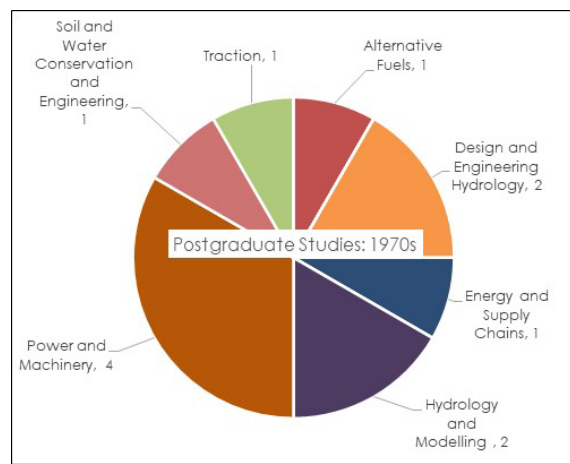
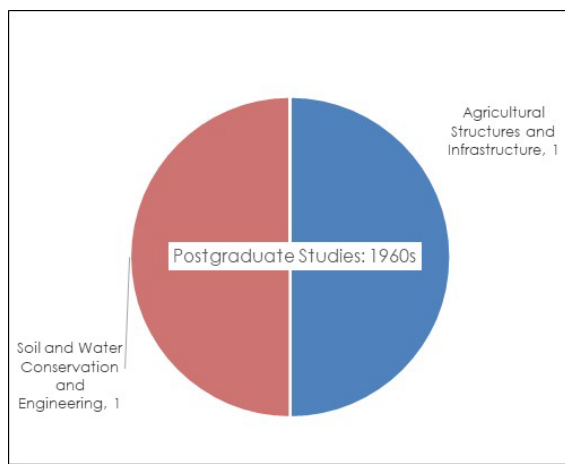
- Sugar and forestry industries on transport logistics,
- Water Research Commission on field studies, irrigation, hydrological modelling and flood related research,
- Royal Academy of Engineering in the UK for flood research and curriculum development,
- Food processing industry
- ZZ2 Group of Companies
- Tomato Producer Organisation
- Agricultural Research Council (Institute of Agricultural Engineering)
- National Research Foundation
- South African Sugar Research Institute
- Agricultural Research Council on irrigation and food processing related research
- MBB Consulting Engineers
- Institute for Commercial Forestry Research

A database of journal publications from the Agricultural Engineering discipline has been collated. Although this database may not include all journal publications, particularly from earlier pre-digital times, the database contains more than 540 journal publications. This is an impressive average of more than nine journal publications per year since the first paper was published in 1976!



Journal papers published

The research fields covered in the postgraduate studies has expanded and evolved over the decades. In the 1960s, postgraduate studies were undertaken in the fields of “Soil and Water Conservation and Engineering” and “Agricultural Structures and Infrastructure”. This was expanded in the 1970s to include “Power and Machinery”, “Traction”, “Alternative Fuels”, “Design and Engineering Hydrology”, “Energy and Supply Chains”, and “Hydrology and Modelling”. These fields were expanded in the 1980s to include “Irrigation Engineering”, while the 1990s saw the addition of studies in “Water Quality”, “Design and Engineering Hydrology”, “Environmental Control” and “Remote Sensing and Machine Vision”. During the 2000s, studies in the “Water-Energy-Food nexus” and “Food Processing and Postharvest Engineering” were undertaken by postgraduate students. Studies in the “Aquaponics and Hydroponics” field were initiated in the 2010s, with most studies focused on the “Design and Engineering Hydrology”, “Food Processing and Postharvest Engineering”, “Irrigation Engineering” and “Energy and Supply Chains” fields. These trends in research fields over time are illustrated in the figures below.



Trends in postgraduate research fields

Staff in the discipline maintain close links to the South African Institute of Agricultural Engineers (SAIAE), serve on national and provincial structures of SAIAE, and thus support the growth and sustainability of the Agricultural Engineering profession in South Africa. Similarly, staff have contributed to the initiation and growth of the Pan-African Society of Agricultural Engineers, thereby promoting and advancing the profession of Agricultural Engineering in Africa. They also serve on various committees of the CIGR (International Association of Agricultural Engineers and the American Society of Agricultural and Biological Engineers (ASABE).

The discipline has strong collaborative relationships with many local universities (e.g. Pretoria, Stellenbosch, Cape Town, Free State, Central University of Technology) and international universities (e.g. Illinois, Florida and Purdue in the USA, Bath in the UK, USQ in Australia, Jiangsu University in China, and in Africa, the University of Nairobi, University of Zimbabwe, and University of Botswana.

Current Staff

Professor Jeff Smithers graduated with a BSc in Engineering (Agricultural) degree and MSc Engineering and PhD degrees from the former University of Natal. He worked as an Engineer in the Directorate of Agricultural Mechanisation, Department of Agriculture. He joined the University of Natal in 1989 as Senior Research Fellow to work on research contracts in the hydrological field. After being employed on research contracts for more than 10 years, he joined the permanent lecturing staff as a Senior Lecturer in 2001. He was promoted to Associate Professor in 2002 and appointed as Professor of Agricultural Engineering in 2004. He served as Head of the School of Bioresources Engineering and Environmental Hydrology at the University of KwaZulu-Natal from 2002 to 2012. In 2019 he was appointed as the uMngeni-uThukela Chair of Water Resources Research and Innovation and has served as the Director of the Centre for Water Resources Research since 2019. He holds an adjunct Professor appointment in the Centre for Agricultural Engineering at the University of Southern Queensland in Australia and a Global Chair appointment at the University of Bath in the UK. Prof Smithers is a registered professional engineer with ECSA, is a fellow of the SAIAE and currently serves on the National Councils of SAIAE and PASAE and is a founding member of PASAE. He has a wide range of research interests, which include design and engineering hydrology, hydrological modelling, energy use and efficiency in agricultural production systems, and he currently leads the National Flood Studies Programme in South Africa. He has supervised 14 PhD, 15 MSc Eng, 17 MSc graduates to date and he has authored 65 peer-reviewed journal papers, 41 research reports, 19 consulting reports. He has been invited as a keynote speaker at both national and international conferences and has made more than 113 conference presentations.



Professor Tilahun Seyoum Workneh has been a part of the staff at UKZN since 2010, when he was appointed as an Associate Professor. He is a graduate of the Department of Agricultural Engineering of one of the oldest universities in Ethiopia, Alemaya University of Agriculture (now Haramaya University). He was retained as a teaching assistant after graduation in 1990 before enrolling at the University College in



Dublin, Ireland for his Masters in Agricultural and Food Engineering. Prof Workneh completed his PhD through the University of the Free State in 2003, during which time he also served at Haramaya University as a lecturer in Agricultural Engineering and taught topics such as food processing, renewable energy and environmental control in farm structures. Prof Workneh was promoted to Associate Professor in 2008 at Haramaya University. He has been involved in establishing curriculum in Agricultural and Biological Engineering, food processing and post-harvest technology, and has supervised a large number of postgraduates during his career, with more than 22 of them being women, a remarkable number in a previously male-dominated field. Prof. Workneh is currently a full professor in the Discipline of Agricultural Engineering at UKZN where he is involved in multidisciplinary research related to food and bio-processing engineering, post-harvest technology and the post-harvest engineering of fruit and vegetables, food processing and preservation, refrigeration storage, renewable energy production and integration into systems.

Dr Alaika Kassim joined UKZN, her alma mater, in 2017 as a lecturer, shortly after attaining her PhD. She was the first female lecturer to be appointed in the Agricultural Engineering discipline at UKZN. Dr Kassim has since been promoted to senior lecturer in 2022. She also served as the Chairperson of the South African Institute of Agricultural Engineers - KwaZulu-Natal branch and still serves as a KZN committee member. Thus



far Dr Kassim's academic achievements have earned her accolades such as the UKZN CAES 'Wonder Woman in Science' and media exposure through on-air radio interviews and features in local newspapers. Dr Kassim's research area is focused on agro-processing technologies stemming from her MSc and PhD studies at UKZN. She has a keen interest in circular bioeconomy and integrating sustainable energy technologies to agricultural systems. She has published a number of scientific journal articles, a book chapter and presented her research at both national and international conferences. She has also graduated four MSc students in her capacity as main and co-supervisor. Dr Kassim is passionate about research and academia and thrives in interacting with students.

Dr Ashiel Jumman joined UKZN in May 2023, after acquiring 13 years of experience as a Research Engineer at the South African Sugarcane Research Institute (SASRI) and two years with the KwaZulu-Natal Department of Agriculture (North Region). Dr Jumman acquired his BSc, MSc Engineering and PhD Engineering degrees at UKZN. Dr Jumman's MSc project focused on the development of a modelling framework to



improve irrigation design and operating strategies to address ongoing challenges in water and energy in the SA Sugarcane industry, while his PhD work ventured into the complex dynamics of social systems and adoption-processes for irrigation scheduling. Dr Jumman has been honoured with several awards for high quality presentations at various conferences and an international travel grant. Dr Jumman is also registered as a professional engineer with the Engineering Council of South Africa and continues to serve on Professional bodies at the KZN branch and National level. At UKZN, Dr Jumman's primary research and lecturing roles are in the field of: (i) Irrigation Engineering and (ii) Soil & Water Conservation Engineering. Additional research interests include farming systems, sustainability, complexity and complex systems, and circular bio-economies. Dr Jumman is passionate about his work and earnestly strives to make the world a better place.

Dr Kassahun Tadesse holds a PhD in Irrigation Engineering (Haramaya University), an MSc in Land Resources Management (Mekelle University), and a BSc in Agricultural Engineering and Mechanisation (Hawassa University), Ethiopia. With over 20 years of professional experience, he has worked as a Soil and Water Conservation Expert, Agricultural Mechanisation Trainer, and in academia as Lecturer, Assistant Professor, and Associate Professor at Debre Markos



University. He has supervised and graduated 10 MSc students in Hydraulic Engineering, Integrated Watershed Management, and Environmental Science, and actively participated in the development of PhD, MSc, and BSc curricula prior to joining UKZN. Since March 2025, he has served as a Senior Lecturer in Agricultural Engineering at the University of KwaZulu-Natal, teaching mechanisation-related courses. His research focuses on water resources management and hydrologic systems, sustainable agricultural mechanisation and precision agriculture, and integration of AI, IoT, and geospatial technologies for smart irrigation and environmental management.

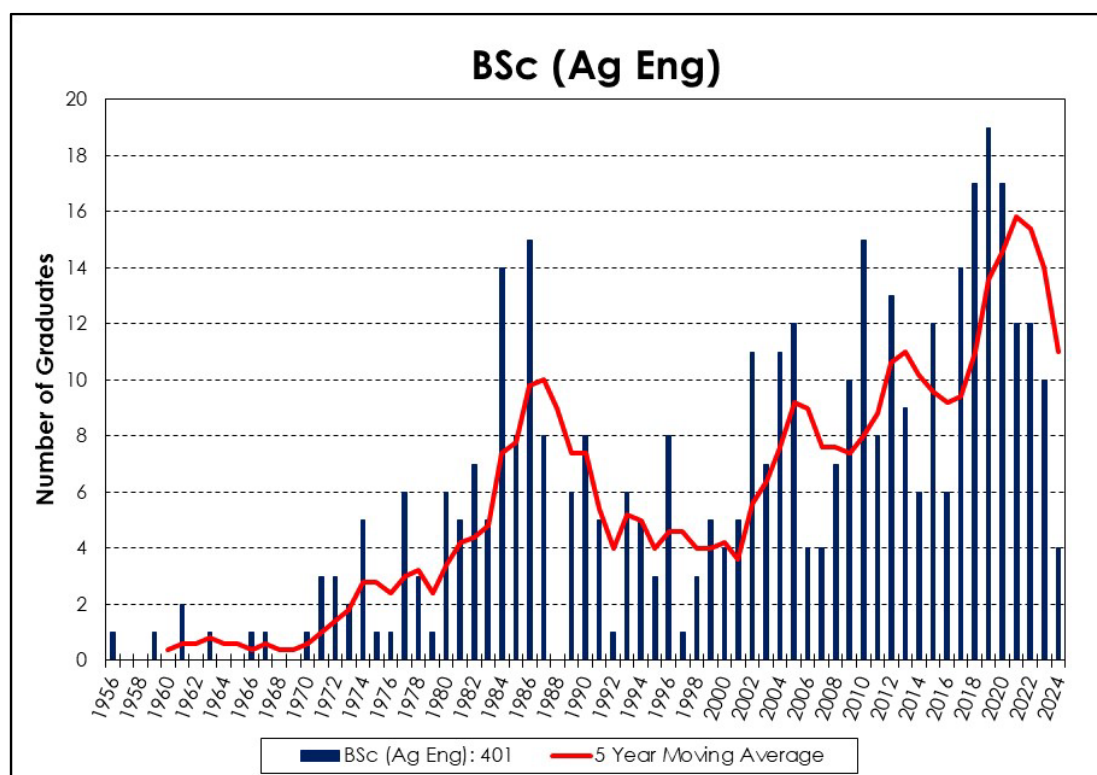
Ms Khuthadzo Ntsowe has been part of the UKZN staff since 2019, when she was appointed as a developmental lecturer under the nGAP programme. She holds BSc and MSc degrees in Agricultural Engineering from the University of KwaZulu-Natal and is currently pursuing a PhD in Engineering. With over 12 years of experience in Agricultural Engineering, her research focuses on food process engineering and the integration of



renewable energy into agriculture. Ms Ntsowe is a candidate engineer registered with ECSA and a member of both the South African Institute of Agricultural Engineers (SAIAE) and the Pan African Society of Agricultural Engineering (PASAE). She has presented her work at national and international conferences and has received travel grants for training purposes from both local and international institutions. She has published seven articles in peer-reviewed journals. In her role as a lecturer, Ms Ntsowe teaches Engineering Design, the Undergraduate Seminar, and various undergraduate modules, and she supervises design and research projects. She is particularly interested in the application of artificial intelligence in education and the development of machine learning models for food processing technology design. She is particularly interested in the application of artificial intelligence in education and the development of machine learning models for food processing technology design.

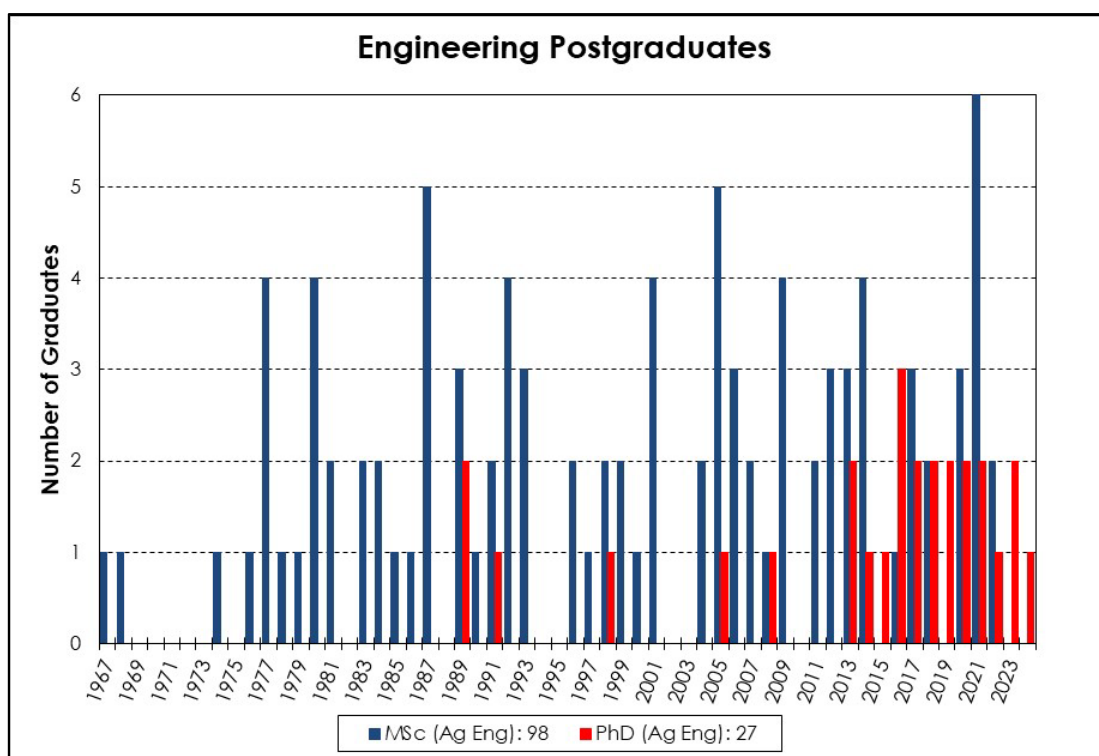
Graduate Output

Four hundred Agricultural Engineers have graduated in the period from 1956 – 2024. While there has generally been an increase in graduates over time, the impacts of the reduced intake due to the COVID pandemic (2020-2023) and subsequent impacts of rapidly transitioning to online delivery of the programme, and online studying by students, is evident in graduate output.



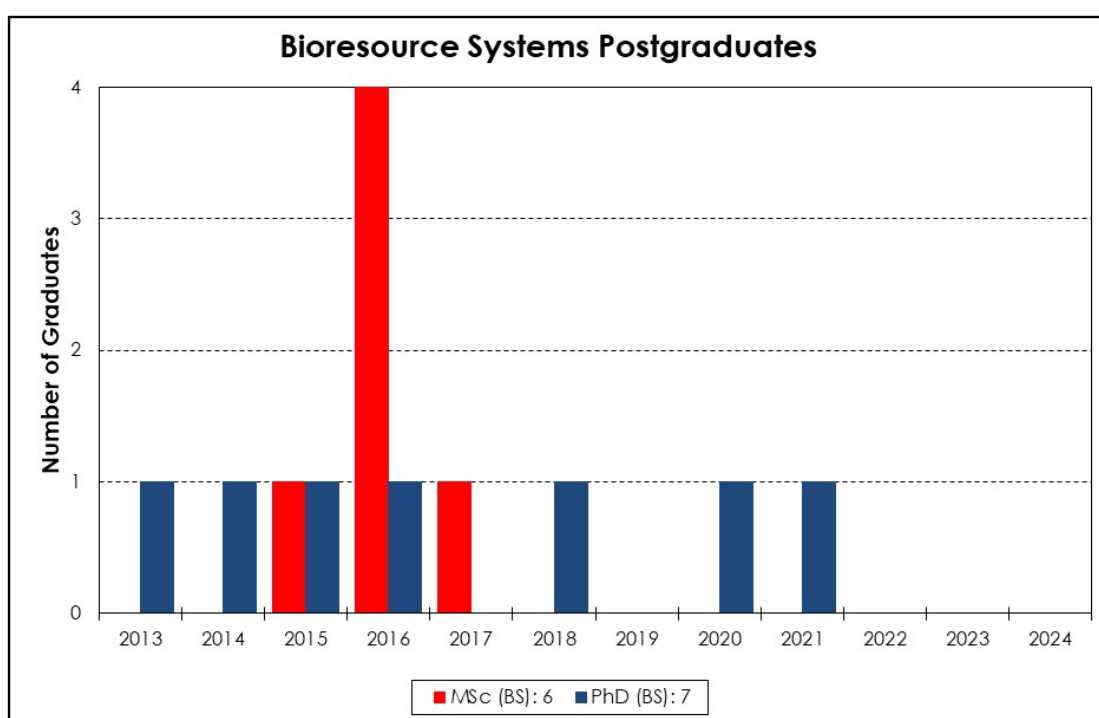
Output of BSc (Agricultural Engineering) graduates

The first MSc (Agricultural Engineering) graduate was Prof Pottie Meiring in 1967, and a total of 98 MSc (Agricultural Engineering) students have graduated to date. The first two PhD (Agricultural Engineering) graduates were Dr Mark Dent and Professor Alan Hansen in 1989, and a total of 27 PhD (Agricultural Engineering) students have graduated to date.



Output of MSc and PhD (Agricultural Engineering) graduates

In order to register non-engineering students for postgraduate degrees, and who do not meet the entrance requirements for Engineering, a postgraduate degree in Bioresource Systems was initiated in 2008 and six MSc (Bioresource Systems) and seven PhD (Bioresource Systems) students have graduated to date.



Output of MSc and PhD Agricultural Systems graduates

Graduated BSc Engineering (Agricultural) Students

† Deceased

Class of 1956

Stephens, Christopher John Hazlitt (Mr)

Class of 1959

Smart, Graham R (Mr)

Class of 1961

Burney, Jack Rider (Dr)

Smith, Anthony John (Mr)

Class of 1963

McQueen, Angus Robert

Class of 1966

Clemison, Michael John (Mr)

Class of 1967

Green, James Edward Peter †(2025)

Class of 1970

Rabie, Pieter Daniel (Mr)

Class of 1971

Du Preez, Morton Wouter (Mr)

Knott, Walter Neil (Mr)

McLean, Darrell Ian

Class of 1972

Haak, Albert Jan (Mr)

Lyne, Peter William Liversedge (Prof)

Whittall, William Arthur Clifton (Mr) †(2019)

Class of 1973

Carter-Brown, Donald Harold (Mr)

Coulson, Stewart Arthur (Mr)

Class of 1974

Cousens, David William Hal (Mr)

Dent, Mark Clifford (Dr)

Joubert, Arthur Bruce Douglas (Mr)

Leisegang, Clyde Robert (Mr)

Liddell, Colin Graham (Mr)

Class of 1975

Murray, Timothy John (Mr)

Class of 1976

Rall, Martin Giles (Mr)

Class of 1977

Arnold, Herbert (Mr)

Bradfield, Michael (Mr)

Drögemöller, Hugo Gottfried (Mr)

Hansen, Mervyn Knud (Mr)

Jacobs, Lourens Martin (Mr)

Pickering, Nigel Bruce (Mr)

Class of 1978

Allan, Robert Stewart (Mr)

Scott, James Jefferson (Mr)

Stacey, Don Roger (Mr)

Class of 1979

Schmidt, Erik John (Mr)

Class of 1980

Bing, Gary (Mr)

Hatley, Malcolm Edward (Mr)

Norton, Alan John (Mr)

Vause, Duncan Mark (Mr)

Vosloo, Adrian Peddie (Mr)

Wiltshire, Richard William Montague (Mr)

Class of 1981

Armstrong, James Alan (Mr)

Freese, Victor (Mr)

Hill, Norman Douglas (Mr) †(2018)

Keyser, Randolph Egon (Mr)

Nel, Theunis Jacobus (Mr) †(2024)

Class of 1982

Bester, Douglas Barrett

Gawler, John Dycer

Gouweloos, Bas (Mr)
Skinner, Anthony Dennis
Smithers, Jeffrey Colin (Prof)
Veysie, Ian William (Mr)
Walker, Andrew John (Mr)

Class of 1983

Dunsmore, Stuart (Mr)
Ford, Mark John Pearce (Mr)
Klintworth, Volney Roland (Mr)
Malujlo, Marek Szymon (Mr)
Tarboton, Kenneth Craig (Dr)

Class of 1984

Angus, Garth Richard (Mr)
Birrell, Stuart James (Dr)
Brown, Andrew Scott (Mr)
Cumming, John Andrew Brownlee (Mr)
Fraser, Alastair Lovat
Galloway, Richard Storm (Mr)
Oellermann, Helmut Rainer (Mr)
Peters, Ulrich Wilhelm (Mr)
Rennie, Alexander Grant (Mr) †(2013)
Robertshaw, Andrew Mark (Mr)
Stanley, Stephen William Ussher (Mr)
Tremlett-Johnstone, Ian Alistair (Mr)
Walters, Cassandra Michelle (Mrs)
Walters, Kevin John Edward (Mr)

Class of 1985

Boothway, David Peter (Mr)
Bremner, Mark Hill (Mr)
Doorman, Michael Willem (Mr)
Furniss, Patrick William (Mr)
Haywood, Richard Wilfred (Mr)
Lotz, Peter Ronald (Mr)
Vermeulen, Paul (Mr)
Williams, Richmond Paul Bowen (Mr)

Class of 1986

Bartels, Rudolf Francis (Mr)
Caldecott, Roy Edwin (Mr)
de la Harpe, Eric Richmond
English, Robin Graham (Mr)
Hill, Michael John (Mr)
Holmes, Charles Alan (Mr)
Knill, Peter David (Mr)

Lawrie, David Knox (Mr)
O'Neill-Williams, David Acland (Mr)
Pienaar, Andrew George (Mr)
Schäfer, Norman Wayne (Mr)
Schrur, Michael Russell John (Mr)
Wardle, Mark Edward (Mr)
Wessels, Marius (Mr)
Wood, James Robert (Mr)

Class of 1987

Blatch, Brendon Talbot (Mr)
Buitendag, Isak (Mr)
Johnson, Geoffrey Cowper (Mr) †(2012)
Kirkpatrick, Stephen James Lowther (Mr)
Lecler, Neil Louis (Dr)
Prinsloo, Guy Andrew John (Mr)
Rencken, Manfred Edgar (Mr)
Swart, Gary Howard (Mr)

Class of 1989

Brooker, Andrew Gordon Pringle (Mr)
Cole, Allen Kevin (Mr)
Cumming, John Capel (Mr)
Dilmitis, Manoussos Peter (Mr)
Downes, David Stuart Trouncer (Mr)
Rudnick, Timothy Simon (Mr)

Class of 1990

Bartleet, Sean Keith (Mr)
Brodie, James Roger (Mr)
De Wet, David Louis (Mr)
Lewin, Ross Charles (Mr)
Smith, Warwick Marshall (Mr) †(2013)
Van Egmond, Dirk Pieter (Mr)
Welter, Jan Theo (Mr)
Zartmann, Mark (Mr)

Class of 1991

Bentley, Craig William (Mr)
Donkin, Andrew David (Mr)
Nicoll, Angus (Mr)
Rea, Ian Patrick (Mr)
Trott, Geoffrey Siward (Mr)

Class of 1992

Kondlo, Nicholas Simphiwe (Mr)

Class of 1993

Broughton, Andrew Bassett
Clark, David John (Dr)
Howe, Bradford John (Mr)
Meier, Kevin Brett (Mr)
Sinclair, Andrew David (Mr)
Taylor, Richard Basil (Mr)

Class of 1994

Emmerich, Roy Martin (Mr)
Hayter, Mark Robert (Mr)
Lawrence, Douglas Norman John (Mr)
Leat, Craig Murray (Mr)
Mulder, Marc Stephen (Mr)

Class of 1995

Van Der Merwe, Richard Julian (Mr)
†(2023)
Vollnhofer, Matthew (Mr)
Wiehe-Lagesse, Robert Denis (Mr)

Class of 1996

Barnes, Andrew John (Mr)
Coleman, Andrew Stuart (Mr)
de Wet, Johannes Marthinus Benjamin
Nash, Stephen Roger (Mr)
Rousset Hardy, Claude Yann (Mr)
Simpson, Gareth Beresford (Dr)
Udal, Michael Charles (Mr)
Van Niekerk, Rory David (Mr)

Class of 1997

Wooding, Hal Kingsley (Mr)

Class of 1998

Christie, Daine Robert (Mr)
Du Preez, Mary-Anne (Ms)
Griffiths, Brent Adrian Kenn (Mr)

Class of 1999

Ascough, Gregory William (Mr)
Butler, Andrew John Edward (Mr)
Marechal, Alain Laurent (Mr)
Seago, Caryn Julie (Miss) [nee Kedge]
Tweddle, Peter Brian (Dr)

Class of 2000

Hundley, Kevin Mark (Mr)
Moodley, Pranesh (Mr)
Nortje, Craig Andrew (Mr)
Simpson, Andrew David (Mr)

Class of 2001

Dupuche, Patrice Vincent
Gregory, Justin Haig
Herbert, Russell Lloyd
Meikle, Bruce James
Muller, Stuart John

Class of 2002

Frezghi, Mehari Sium
Lusso, Cary Donald
Moult, Nicholas Greig
Onkay, Teklit Keleta
Queripel, Pierre
Sahle, Michael Berhe
Schroder, Joathan Harold
Talanda, Colin Erlo
Thornycroft, Kent Charles
Triegaardt, Wanda
van der Merwe, Peter

Class of 2003

Eweg, Jonathan Lindsay (Mr)
Giles, Ryan Cameron (Mr)
Greaves, Kevin Robert (Mr)
Marx, Barend Jan (Mr)
Monyepao, Mohlatlego Solomon (Mr)
†(2020)
Tekle, Tesfazghi Ghetinet (Mr)
Teweldebrhan, Asmerom Teclezghi (Mr)

Class of 2004

Dlamini, Bonisile Lucy (Ms)
Handyside, Michael John
Holmes, Mathew (Mr)
Langton, Matthew Innes (Mr)
Moothilal, Ria (Mr)
Nxumalo, Lunga Thembokwakhe Donald (Mr)
Paterson, John William Stuart (Mr)
Pullin, Andrew James (Mr)

Strang, Gavin Colin (Mr)
Stutterheim, Peter (Mr)
Sukati, Ntombifuthi Ethel (Ms)

Class of 2005

Bailey, Nicola Catherine (Ms)
Buis, Bryce †(1982-2019)
Chrystal, Robynne Angela (Dr) [née Lawrie]
Jumman, Ashiel (Dr)
Lagerwall, Gareth Lynton (Mr)
Mdlovu, Kholiwe Bethu Faith (Ms)
Mills, Dustin David (Mr)
Pletts, Troy Robin (Mr)
Shongwe, Bernard Lucky (Mr)
Sibandze, Bhekiwe Patrice (Mr)
Simelane, Sabatha Mcuku (Mr)

Class of 2006

Black, Erik Knut (Mr)
Harris, Alasdair John (Mr)
Mashamaite, Madimetja Isaiah (Mr)
Mdluli, Mphumelelo (Mr)

Class of 2007

Baier, Trevor James Arthur (Mr)
Boote, Darran Nelson (Mr)
Dlamini, Gcwalisile Sifiso
Kunene, Gcwalisile (Mrs)

Class of 2008

Mabadi, Mxanxathi James (Mr)
Maroo, Keamogetsoe Ipeleng (Ms)
Meyiwa, Thandeka Claudia (Ms)
Motebejane, Day-Off Kabelo Magole (Mr)
Naidu, Raishan (Mr)
Nkomo, Sfundo Eksodus (Mr)
Zimu, Mkhanyiseni Goodenough (Mr)

Class of 2009

Boote, Gordon Louis Nelson (Mr)
Dladla, Lungisani Titus (Mr)
Fraser, Bruce Stuart (Mr)
Lebotsa, Mamashege Gladys (Ms)
Lebotsa, Phalane Sekina (Ms)
Maidi, Frank Tebe (Mr)

Mamabolo, Mahlatse Arone (Mr)
Moodley, Samantha (Ms)
Neethling, Devon Lynton (Mr)
Thwala, Buyisiwe Mavis (Ms)

Class of 2010

Hlophe, Mxolisi (Mr)
Jasat, Tahir(Mr)
Jugdawooh, Prashen (Mr)
Kassim, Alaika (Dr)
Kgaphola, Thato Makgomeng (Ms)
Magama, Primrose Paidamoyo (Ms)
Mailula, Joseph Matome (Mr)
Mamogobo, Magome Cunningham (Mr)
Mavundza, Thabo (Mr)
Mbokazi, Celukuthula Welcome (Mr)
Mpai, Tumiso (Ms)
Nemakhavhani, Lufuno (Mr)
Ngcamu, Nhlanhla Alex (Mr)
Nsele, Nkosinathi Joseph (Mr)
Sibuyi, Dumisani Elmon (Mr)

Class of 2011

Amutenya, Helen Kauko (Ms)
Baloyi, Emanuel Kulani (Mr)
Gurira, Setsembile Chikondi [née Dlamini] (Ms)
Hull, Andrew James (Mr)
Mashishi, Madimetja Solomon (Mr)
Molepo, Maseroke Yvone Esther (Ms)
Ngejane, Mzukisi (Mr)
Thipe, Ellen Letsogile (Ms)

Class of 2012

Buthelezi, Sandile Eustace (Mr)
Domleo, Ryan Rhett (Mr)
Jenkins, Edwin Peter Garland (Mr)
Mabye, Samora Mokhine (Mr)
Mdhluli, Faith Tokologo (Ms)
Monyepao, Mmakgoana Frans (Mr)
Mugodo, Khuthadzo (Ms)
Muhembo, Rudolf Likoro (Mr)
Muzondo, Fate Tharullo (Dr)
Ndou, Thovhedzo Maxwell (Mr)
Ramakgapola, Tshifhiwa Daniel (Mr)
Rees, Bryan (Mr)
Sookdeo, Marisha (Ms)

Class of 2013

Aldous, Jac Guy (Mr)
Johnson, Robyn Anne (Ms)
Kekana, Maesela Jan (Mr)
Makwela, Ndwamato Joseph (Mr)
Manyako, Khutsang Erence (Mr)
Mohapi, Morapeli Elliott (Mr)
Morake, Kgaugelo Windsor (Ms)
Pikwa, Awonke (Ms)
Zungu, Khayelihle (Mr)

Class of 2014

Bernstein, Nathan Calarni (Mr)
Gumede, Nosipho Sinegugu (Ms)
Homann, Roelof Jacobus (Mr)
Mofokeng, Sellwane Patricia (Ms)
Van Der Walt, Andries Johannes (Mr)
Zulu, Donald Thabo (Mr)

Class of 2015

Gugushe, Vuyisa Sentle (Ms)
Hadebe, Thankslord Seluleko (Mr)
Kirkman, Jonathan Donald (Mr)
Mbanjwa, Kwanele Mongezi (Mr)
Mdlalose, Sipiwe Nduduzo (Mr)
Nduli, Namisani Nicholus (Mr)
Nkhata, Rebecca (Ms)
Ntuli, Siphesihle Thembela (Mr)
Piliso, Piwe Vuyo (Ms)
Sibisi, Thandekile Happiness (Ms)
Siyaya, Thokozile Princess (Ms)
Xelete, Zukile (Mr)

Class of 2016

Buyeye, Zikhona (Miss)
Gasa, Siyabonga Roborn (Mr)
Malila, Njabulo (Mr)
Mokou, Lesego (Mr)
Sutcliffe, Roanne Ruth (Ms)
Tsamai, Khumo Gaopalelwe (Ms)

Class of 2017

Blaker, Alex (Mr)
Boroto, Tumelo Frans (Mr)
Chuene, Zanele Eunice (Ms)
Cossa, Steven Mafutha (Mr)

Green, Susan Jaime (Ms)
Harvey, Tyler Ann (Ms)
Madonsela, Andile Precious (Ms)
Mbhamali, Zama (Mr)
Molekoane, Selaelo Victor (Mr)
Moloko, Kholofelo Khomotso (Mr)
Motloung, Albert Thabo (Mr)
Nkambule, Siboniso Nhlanhla (Mr)
Roux, Vikoux Willem (Mr)
Sithole, Bokang (Ms)

Class of 2018

Dladla, Sphamandla (Mr)
Dubazana, Zamangwane (Ms)
Maharaj, Udhav (Dr)
Mahlamvu, Sandisiwe (Ms)
Makalima, Lazola Qhawe Mfundo (Mr)
Masango, Nkosinathi (Mr)
Mathonsi, Zamadunga Nosipho
Samkelisiwe (Ms)
Miya, Silindokuhle Loreen (Ms)
Mnguni, Siyathokoza Bongela (Mr)
Mofokeng, Nthabeleng Honey (Ms)
Mukansi, Demian Vusimusi (Mr)
Murugan, Kimaine Soobramoney (Mr)
Ngubo, Nokukhanya Amanda (Ms)
Pickford, Sarah Joy (Ms)
Qwabe, Mzwandile Wiseman (Mr)
Upton, Richard (Mr)
Ziqubu, Nkosinathi Jabulani (Mr)

Class of 2019

Chauke, Percy Motsamai (Mr)
Dladla, Sandile Sifiso (Mr)
Dlamini, Nosipho (Ms)
Govender, Lavanya (Ms)
Madonsela, Bhoyane Mphumelelo (Mr)
Magaqa, Avuyile (Mr)
Manailana, Itumeleng Emsy (Ms)
Masoko, Caesar Thato (Mr)
Mkhehle, Thembela (Mr)
Mkhonta, Sizwe Thembelihle (Mr)
Mmako, Karabo Precious (Mr)
Msibi, Nondumiso
Msomi, Nqobani (Mr)
Mthembu, Arise Sakhile (Mr)
Notshweleka, Asavela (Ms)

Sekwakwa, Kwena Matlakala (Ms)
Sithole, Thobile Nokwanda (Ms)
Stringer, Brendan William (Mr)
Zwane, Philisiwe Precious (Ms)

Class of 2020

Cele, Nkosingiphile Fortune (Mr)
Goge, Minenhle (Ms)
Khuleni, Loyiso (Mr)
Lutchman, Samara Tanya (Miss)
Madel, Happy Noluthando Qinisile (Miss)
Mahlalela, Muzi Wandile Irvin Sethu (Mr)
Mnguni, Khanyisile (Ms)
Mphahlele, Kgomotlokwa Reitshepetse (Ms)
Mthethwa, Perm (Ms)
Ncoshe, Malibongwe Innocent (Mr)
Netshirungulu, Wamashudu
Mukonazwothe (Ms)
Nsele, Sishosonke Caspar (Mr)
Ntsinjana, Songezo (Mr)
Nzima, Knowledge Dan (Mr)
Sontube, Khwezi Prince (Mr)
Thabethe, Phelelani (Mr)
Tshamela, Simbulele (Mr)

Class of 2021

Dlamini, Thobani (Mr)
Khumalo, Thembelani (Mr)
Liebenberg, Petrus Jacobus (Mr)
Mayuze, Zanele (Ms)
Mkhulise, Lindokuhle (Mr)
Moodley, Preneshnee (Ms)
Moodley, Sajayen (Mr)
Mtshali, Bongiwe Samkelisiwe (Ms)

Nengwenani, Maano (Mr)
Ngubane, Sibusiso Lungisani (Mr)
Nkabinde, Nkanyiso Mxolisi (Mr)
Thaba, Julias Phopimudanalo (Mr)

Class of 2022

Khumalo, Melusi (Mr)
Lubanyana, Sphelele (Mr)
Masha, Dikgamanyane Lettie (Ms)
Mlaba, Nduduzo Hlanganiso (Mr)
Mothiba, Koena (Ms)
Mthembu, Aspire Ntokozo (Ms)
Ntshangase, Zothile (Ms)
Piek, Jared (Mr)
Sikhakhane, Khanyisani Hlokomani (Mr)
Singwane, Bheki (Mr)
Thabethe, Thulebona Handsome (Mr)
Zimu, Nokwazi Ashley (Ms)

Class of 2023

Biyela, Lindokuhle Sakhiseni (Mr)
Biyela, Sandile (Mr)
Jozini, Ntando Emmanuel (Mr)
Mdakane, S'Phesihle (Mr)
Mosehla, Lefa (Mr)
Mpanza, Thalente (Mr)
Mthembu, Msizi Lucius (Mr)
Weder, Emil Friedrich (Mr)
Zakwe, Siboniso (Mr)
Zondi, Minenhle (Mr)

Class of 2024

Daniel, Riya Christel (Ms)
Gangat, Sulaiman Dawood (Mr)
Mohabeer, Breyton Deiniol (Mr)
Xolo, Khulekani Mzuvukile

Graduated Masters Students

† Deceased

Class of 1967	Title
Meiring, Potgieter (Prof) †	A design for and the test of a miniature research silo for the preservation of silage
Class of 1967	
Burney, Jack Rider (Dr)	A critical appraisal of the Rocky Mountain rainfall simulator as a means for deriving realistic soil infiltration capacity curves
Class of 1974	
McLean, Darrell Ian	Decline in power and performance of diesel tractors
Class of 1976	
Lyne, Peter William Liversedge (Prof)	A wheel slip meter for measuring tractive efficiency of tractors
Class of 1977	
Cousens, David William Hal (Mr)	Modelling of small watershed flood hydrographs
Dent, Mark Clifford (Dr)	An instrumentation system for monitoring tractor traction parameters
Hansen, Alan Christopher (Prof)	An efficiency meter to optimise the performance of diesel tractor engines
Hugo, Francois Johannes Cornelius (Mr)	The design of an ultra-low volume sprayer
Class of 1978	
Rall, Martin Giles (Mr)	The field performance of an efficiency meter for diesel tractors
Class of 1979	
Hope, Allen Seymour (Mr)	Estimation of catchment moisture status for the SCS stormflow model
Class of 1980	
Allan, Robert Stewart (Mr)	Ethanol based fuel blends for diesel tractors
Arnold, Herbert (Mr)	Suggested modification to the estimation of runoff volume by the SCS model
Jacobs, Lourens Martin (Mr)	Optimisation of the tractive and engine performance of a tractor

Smithen, Andrew Arthur (Mr)	Characteristics of rainfall erosivity in South Africa
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Class of 1981

Keen, James Francis	A real-time processor to monitor diesel tractor performance
Schmidt, Erik John (Mr)	Improved estimates of peak flow rates using modified SCS lag equations

Class of 1983

Hill, Norman Douglas (Mr) †(2018)	Tractor performance with ethanol-diesel fuel
Vosloo, Adrian Peddie (Mr)	Evaluation of selected ethanol/diesel blends for tractors

Class of 1984

Smithers, Jeffrey Colin (Prof)	A computer control system to optimise tractive efficiency
Walker, Andrew John (Mr)	Real-time mapping of tractor power-speed distributions

Class of 1985

Dunsmore, Stuart	Antecedent soil moisture in design stormflow estimation
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Class of 1986

Seed, Alan William (Mr)	The techniques of rainfall mapping
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Class of 1987

Angus, Garth Richard (Mr)	A Distributed version of the Acru model
Bremner, Mark Hill (Mr)	A Performance-based system for tractor gear selection
Furniss, Patrick William (Mr)	Planning for effective irrigation water utilization
Rennie, Alexander Grant (Mr) †(2013)	The efficiency of tractor power utilization
Taylor, Andrew Bruce (Mr)	Combustion quality of selected compression-ignition fuels

Class of 1989

Bartels, Rudolf Francis (Mr)	Optimum utilization of tractor and implement in tillage operations
Boothway, David Peter (Mr)	Combustion pressure stress with alternative fuels in compression ignition engines
Caldecott, Roy Edwin (Mr)	A distributed model for hydrograph simulation and routing

Class of 1990

Buitendag, Isak (Mr)	Modelling infiltration under different tilled conditions
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Class of 1991

Dilmitis, Manoussos Peter (Mr)	Combustion of ignition-improved ethanol in diesel engines
Haywood, Richard Wilfred (Mr)	Model evaluation for simulating runoff from sugarcane fields

Class of 1992

Brodie, James Roger (Mr)	Size assessment of stacked timber using machine vision
Brooker, Andrew Gordon Pringle (Mr)	Computer vision system for quantifying engine valve deposits
De Wet, David Louis (Mr)	Assessment of impacts of feedlots on water quality in the Mgeni catchment
Zartmann, Mark	Soil water utilisation of Eucalypts under irrigation

Class of 1993

Bentley, Craig William (Mr)	Machine vision measurement of nozzle spray distributions
Donkin, Andrew David (Mr)	An investigation into the hydrology of the Ntabamhlope wetland, with particular reference to the estimation of total evaporation
Fraser, Alastair Lovat	Tractor field performance using alternative fuels

Class of 1996

Amankrah, Anthony Kofi (Mr)	Thermal analysis of a naturally ventilated broiler house
Clark, David John (Dr)	Model for simulating on-road vehicle performance

Class of 1997

Meier, Kevin Brett (Mr)	Development of a spatial database for agrohydrological model applications in southern Africa
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Class of 1998

Howe, Bradford John (Mr)	Development of new techniques for variable source area sediment yield modelling
Leat, Craig Murray (Mr)	A model of degree-day performance for broiler houses

Class of 1999

Barnes, Andrew John (Mr)	Simulation modelling of sugarcane harvest-to-crush delays
Van Niekerk, Rory David (Mr)	Dynamic measurement system for tyre rolling resistance

Class of 2000

Coleman, Andrew Stuart (Mr)	A high resolution digital system for automated aerial surveying
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Class of 2001

Ascough, Gregory William (Mr)	Procedures for estimating gross irrigation water requirement from crop water requirement
Butler, Andrew John Edward (Mr)	The development and evaluation of an operating rule framework for the ACRU agrohydrological modelling system
Seago, Caryn Julie (Miss) [nee Kedge]	An evaluation of selected appropriate irrigation technologies for small-scale farmer
Govindasamy, Prabeshan (Mr)	Predicting emissions using an on-road vehicle performance simulator

Class of 2004

Lusso, Cary Donald	A study on reducing primary transport costs in the South African timber industry
Talanda, Colin Erlo	The design, construction and testing of a mobile essential oil distillation unit

Class of 2005

Eweg, Jonathan Lindsay (Mr)	The design and testing of soil pressure sensors for in-field agricultural and forestry traffic
Frezghi, Mehari Sium	Merged Rainfall Fields for Continuous Simulation Modeling
Marx, Barend Jan (Mr)	The evaluation of pressure distribution and bulk density models for infield agriculture and forestry traffic
Moult, Nicholas Greig	The development of a catchment scale irrigation systems model for sugarcane
Tewolde, Mesfin Hagos	Flood routing in ungauged catchments using Muskingum methods

Class of 2006

Herbert, Russell Lloyd	Validation of a vehicle performance modelling system
Langton, Matthew Innes (Mr)	Design of a brush cutter blade and its integration into a semi mechanized sugarcane harvesting system
Stutterheim, Peter (Mr)	An integrated sugarcane supply chain model: Development and demonstration

Class of 2007

Greaves, Kevin Robert (Mr)	Quantifying and benchmarking irrigation scheme performance with water balances and performance indicators
Griffiths, Brent Adrian Kenn (Mr)	In-field evaluation of irrigation system performance within the sugarcane industry of the south-east Lowveld in Zimbabwe

Class of 2008

Harris, Alasdair John (Mr)	Development of a spatial sugarcane transport infrastructure-planning model
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Class of 2009

Giles, Ryan Cameron (Mr)	A simulation study of cane transport system improvements in the Sezela Mill area
Jumman, Ashiel (Dr)	A framework to improve irrigation design and operating strategies in the South African sugarcane industry
Mills, Dustin David (Mr)	Development and assessment of an automatic short furrow irrigation system
Pletts, Troy Robin (Mr)	The feasibility of automatic on-board weighing systems in the South African sugarcane transport industry

Class of 2011

Gomo, Taziva	Assessing the performance of smallholder irrigation in South Africa and opportunities for deriving best management practices
Moodley, Samantha (Miss)	An investigation into sugarcane vehicle loading with respect to influences on overall transport efficiency

Class of 2012

Boote, Gordon Louis Nelson (Mr)	Issues pertaining to cane supply reliability and stockpiling at the Umfolozi sugar mill - model development and application
Malota, Mphatso	An assessment of shallow water tables and the development of appropriate drainage design criteria for sugarcane in Pongola, South Africa
Mutenje, Tendai Justin	The development and evaluation of a radio frequency identification based cattle handling system

Class of 2013

Boote, Darran Nelson (Mr)	The development and assessment of a direct energy calculator for use in sugarcane production
Kassim, Alaika (Dr)	Evaluating the effects of pre-packaging, packaging and varying storage environment treatments on the quality of avocados (<i>Persea americana</i> mill.)
Shaame, Shaame	Improving water productivity in irrigated rice paddies in Zanzibar

Class of 2014

Cherono, Kipchumba	Infrared drying of biltong: effect of pre-treatment and drying conditions on the drying characteristics and product quality
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Jenkins, Edwin Peter Garland (Mr)	Modelling sugarcane quality in the context of mill scale supply chain logistics
Rees, Bryan (Mr)	Evaluation of systems to harvest, process and transport sugarcane biomass
Thipe, Ellen Letsogile (Ms)	Comparative analysis of two greenhouse microclimates in the sub-humid climate of South Africa

Class of 2015

Sambo, Doctor Calvin (Dr)*	Assessment of the performance of small-scale water infrastructure (SWI) for multiple uses in Nebo Plateau, Sekhukhune District, South Africa
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Class of 2016

du Plessis, Erna	Evaluation and modelling of different greenhouse microclimates under South African agro-climatic conditions
Dzapatsva, Precious*	The effects of precipitation on the sugarcane supply chain of Sezela and Umzimkulu
Kwenda, Phyllis Rumbidzai (Dr)*	System Analysis of Operational Efficiencies at Mhlume Sugarmill in Swaziland using Season Modeling Approaches
Paraskevopoulos, Aresti Lambros*	Improvements to the functionality of the mycanesim irrigation scheduling advice system for sugarcane
Shezi, Sabelo	Evaluation of the effects of supply chain routes and pre-storage treatments on the postharvest quality of stored 'Nemo-Netta' tomatoes

Class of 2017

Johnson, Robyn Anne (Miss)	Improving rainfall erosivity estimates for the design of soil conservation structures in South Africa
Mugodo, Khuthadzo (Miss)	Evaluation of the effects of pre-drying treatments and drying methods on the drying kinetics and quality of Tommy Atkin mango slices
Onyando, Francis Collins Muga (Dr)	Characterisation of the electrochemical properties of maize grain contaminated with Aflatoxin
Selala, Malekeng Sylvester (Mr) *	The development of models (frameworks) for sustainable rehabilitation of rural small-scale water infrastructure for rural communities of Makhudutamaga Local Municipality, Limpopo Province, South Africa

Class of 2018

Dirwai, Tinashe Lindel (Dr)	Engineering and water governance interactions in smallholder irrigation schemes for improved water management
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Mdlalose, Sipiwe Nduduzo (Mr)	Development of a naturally-ventilated solar energy-assisted maize seed store
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Class of 2020

Gasa, Siyabonga Robert (Mr)	Drying of sweet potato tubers using a naturally-ventilated solar-venturi dryer and a hot-air dryer
Nkambule, Siboniso Nhlanhla (Mr)	The development of a sheller for Bambara groundnuts
Piliso, Piwe Vuyo (Miss)	Design and development of a solar powered irrigation system model for South Africa

Class of 2021

Buyeye, Zikhona (Miss)	Comparative evaluation of small-scale vertical hydroponic structures against growing plants in soil with respect to growth parameters and resource use efficiencies
Dladla, Sandile Sifiso (Mr)	Effects of different packaging materials and storage conditions on the quality attributes of tomato fruits
Khoosal, Shaheil (Mr)	The use of local information from donor catchments to improve selected deterministic and empirical flood estimation methods used in South Africa
Makalima, Lazola Qhawe Mfundo (Mr)	Feasibility of Run-of-River Hydropower for Rural and Agricultural Productivity in South Africa
Mukansi, Demian Vusimusi (Mr)	The effects of different storage environments on the quality of stored amadumbe (<i>Colocasia esculenta</i> L. Schott) corms, flours, and their starches
Notshweleka, Asavela (Miss)	Characterisation of biodegradable packaging materials and evaluation of their effectiveness in the shelf-life extension of round and cherry tomatoes

Class of 2022

Dlamini, Nosipho (Miss)	Developing integrated climate change adaptation strategies using the water-energy-food nexus approach: a case study of the Buffalo River Catchment, South Africa
Mthethwa, Perm (Miss)	Wind power generation and integration into a low-cost fresh produce preservation technology: a case of a renewable energy integration into an evaporative cooling system

* MSc (Bioresources Systems)

Graduated PhD Students

† Deceased

Class of 1989	Title
Dent, Mark Clifford (Dr)	Crop water requirements for irrigation planning in South Africa
Hansen, Alan Christopher (Prof)	A diagnostic quasi-dimensional model of heat transfer and combustion in compression-ignition engines
Class of 1991	
Lyne, Peter William Liversedge (Prof)	Automated processor for optimizing tractor operation
Class of 1998	
Smithers, Jeffrey Colin (Prof)	Development and evaluation of techniques for estimating short duration design rainfall in South Africa
Class of 2005	
Lecler, Neil Louis (Dr)	Performance of irrigation and water management systems in the lowveld of Zimbabwe
Class of 2008	
Kongo, Victor Mutuku (Dr)	Balancing water for food and environment: hydrological determinants across scales in the Thukela River Basin
Class of 2013	
Nordengen, Paul Anthony (Dr)	The development and evaluation of a performance-based standards approach for regulating the use of heavy vehicles in South Africa
Sanjika, Thawani Mpatama (Dr) *	Driving factors-based approach for identifying performance indicators in sugarcane supply and processing systems
Waswa, George Wabwile (Dr)	Transient pressure waves in hillslopes
Class of 2014	
Kadwa, Muhammad (Dr)*	A comprehensive qualitative and quantitative assessment of harvesting and other sugarcane supply chain disruptions within the Eston Mill supply area
Kollongei, Julius Kipkembo (Dr)	Non-point source pollution processes and connectivity modelling in the Mkabela Catchment, South Africa

Class of 2015

Gericke, Ockert Jacobus (Prof)	Estimation of catchment response time in medium to large catchment in South Africa
Sibomana, Malindi Sylvester (Dr)*	An assessment of the feasibility of quality indicators for the postharvest deterioration of sugarcane (<i>Saccharum officinarum</i> L.)

Class of 2016

Jumman, Ashiel (Dr)	Using system dynamics to explore the poor uptake of irrigation scheduling technologies in a commercial sugarcane community in South Africa
Kassim, Alaika (Dr)	Development of a small-scale in-field integrated postharvest citrus treatment unit
Ngobese, Nomali Ziphorah (Dr) *	Characterisation of potato cultivars recently released in south africa for frozen French fries
Tweddle, Peter Brian (Dr)	Estimating traffic induced sugarcane losses for various harvesting, loading and infield transport operations in South Africa

Class of 2017

Cherono, Kipchumba	Development and optimization of an integrated post-harvest management system for the handling and storage of fresh tomatoes in South African supply chains
Mkhathini, Khangelani Maxwell (Dr)*	Effect of maturity and postharvest handling of <i>Prunus persica</i> 'landrace' produced in KwaZulu-Natal: case study of physicochemical properties, tunnel solar drying and quality of processed products
Tolesa, Getachew Neme (Dr)	Modelling of micro-environment inside evaporatively and coolbot cooled stores using computational fluid dynamics models and changes in quality of stored tomatoes

Class of 2018

Busari, Isiaka Toyin (Dr)	Investigating the effects of irrigation water management techniques using anaerobic baffled reactor (ABR) effluents for crop production
Clark, David John (Dr)	Object-orientation and integration for modelling water resource systems using the ACRU model
Mchunu, Nthobeko (Dr)*	Optimising aquaponics production in south africa through the development of a model using local species and environmental conditions

Class of 2019

Kanda, Edwin Kimutai (Dr)	Soil water dynamics and response of cowpea to water availability under moisture irrigation
Mabuku, Monde Petrina (Dr)	Flood disaster preparedness and impacts on rural households: a comparative study of Mwandi District of Zambia and Eastern Zambezi Region of Namibia

Class of 2020

Otim, Daniel (Dr)	Development of updated design norms for soil and water conservation structures in the sugar industry of South Africa
Sambo, Doctor Calvin (Dr) *	Free basic water services standards as indicators to assess inequalities in sustainable access to improved water services
Simpson, Gareth Beresford (Dr)	The development of the water-energy-food nexus index and its application to the Southern African Development Community

Class of 2021

Dirwai, Tinashe Lindel (Dr)	Moistube irrigation characterisation and yield response of canola (<i>Brassica napus</i>) under varied moistube irrigation
Kwenda, Phyllis Rumbidzai (Dr) *	Determining an Integrated Household Solid Waste Management Action Plan for Harare, Zimbabwe: A Systems Dynamics Approach
Onyando, Francis Collins Muga (Dr)	Modelling the infrared assisted hot air drying of beef for biltong production

Class of 2022

Tagwi, Dayton Peniel (Dr)	New approaches to the determination of minor frictional losses in irrigation systems
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Class of 2023

Maharaj, Udhav (Dr)	Further development, updating and assessment of the SCS-SA model for design flood estimation in South Africa using a continuous simulation approach
Loots, lone (Dr)	Improved understanding and modelling of hydrological responses in South African urban areas

Class of 2024

Taguta, Cuthbert (Dr)	Implementation of the Water-Energy-Food (WEF) Nexus: A Case Study Approach of Southern Africa
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* PhD (Bioresources Systems)

Alumni Biographies

Mr Angus Robert (Rob) McQueen

Graduation cohort: 1963

Rob's time as a student at the University of Natal was slightly extended, as he repeated his first and third years in Durban. During this time, he became an active member of the Student Representative Council, contributing to student life at a time when Rag was a significant feature of university culture. He graduated in 1964, becoming the third fully qualified Agricultural Engineering graduate from the University of Natal, following Christopher Stephens and Jack Burney.

At that time, the Agricultural Engineering programme spanned five years, with three years based in the Department of Civil Engineering at Howard College in Durban.

As the sole student in his fourth and fifth years, much of his instruction took place in the offices of Professor Vorster and Pottie Meiring. He also attended courses such as Agronomy and Soil Conservation in other lecture halls. Among his additional responsibilities was proofreading the constitution of the South African Agricultural Engineers Institute, which had been drafted by Professor Vorster.

Following graduation, he accepted his first professional appointment as a lecturer in the Department of Agriculture at Glen College near Bloemfontein, where he taught farming students. After seven months, he moved to Pretoria to join the South African Citrus Exchange as a Packhouse Engineer, a position he held for ten years.

In 1974, he and his family relocated to the Lowveld, where they established a fish farming enterprise. At that time, aquaculture was still in its infancy in South Africa, and they found themselves pioneers in an emerging industry that lacked financial and institutional support. After nine years, the enterprise was discontinued, but the experience proved both challenging and rewarding. Their 25-hectare farm was located just outside White River in Mpumalanga.

He subsequently returned to engineering and was seconded by consulting firms, for which he worked, to the Kangwane Government. Over a five-year period, he served in two capacities: initially within the Department of Agriculture, and later within the Department of Public Works.

In 1990, he established his own company, focusing primarily on mechanical engineering services to the timber, sugar, and paper industries in the Lowveld

region. After 32 successful years in operation, he closed the business and retired.

In 2022, he and his wife, Liz, relocated to Riebeek Kasteel in the Western Cape after spending 48 years on their farm in White River. Both are in good health, they remain active and engaged in their new community.

Liz is a qualified pharmacist. The couple have four children. Their eldest, Sharon, studied Physical Education at Rhodes University and has pursued a diverse career in Central Africa, Bahrain, and now Stellenbosch. Their son Jeffery studied Electrical Engineering at the University of Natal and has worked for Shell Petroleum in South Africa and the United Kingdom, later joining BP International. Their third child, Neil, also an Electrical Engineering graduate of the University of Natal, is based in Germany, where he works for a company specialising in microchip development. Their youngest, Linda, studied Office Management and Personal Assistance at the Natal Technikon and resides in the Howick area.

They are proud of their four children, who have each demonstrated resilience and adaptability in the face of life's challenges. They are also the grandparents of ten grandchildren and great-grandparents to one.

Mr Morton W du Preez

Graduation cohort: 1971

Prior to his retirement at the end of 2017, Morton had a recognised track record as a professional engineer with over 40 years' experience. He specialised in project management, services management and management support in the field of water supply and sanitation with public utilities and various levels of government.



As manager of Management Consulting Services for a previous employer, key performance areas included business management, restructuring, project management, planning, design and contract administration, asset management, risk management, and the integration of technical, institutional and engineering services. Morton has also been extensively involved in capacity building at regional and local authority levels. He has a CETA training accreditation in project and contract management.

Morton's passion for improving people's circumstances, and particularly water-related development, is supported by a sound knowledge of the engineering industry and extensive experience in the developing areas of South Africa.

His work experience was complemented by a BScEng (Agriculture), a Certificate in Public Management, and registration as a Professional Construction Project Manager. He is a Registered Professional Engineer and a member of several professional associations.

Morton currently lives in Fareham in the United Kingdom on the south coast of England. Married to Susan (née Morse), who completed her Bachelor of Arts at the University of Natal, Durban, in 1970, and a qualification in Education on the Pietermaritzburg campus in 1971. They have three daughters, Katherine, Michelle and Nicole, also resident in the UK, and two grandsons. Both are active in their church. Morton has been active in establishing a Men's Shed and is a member of the local Probus Club. He has introduced his older grandson to flyfishing for trout and surf fishing for seabass. He also potters around in his workshop and provides the muscle for Sue in the garden. For exercise, Morton goes for walks with their dog and the neighbour's dog.

Impact of Agricultural Engineering on you:

- "Although my degree was in Agricultural Engineering it equipped me for a wide variety of roles in both public and private sectors. If I had my time over again I would do it all again, albeit some things a little differently."

Inspirational Phrase

- "Called to serve."

Mr Albert Jan Haak

Graduation cohort: 1972

Albert is a dedicated Agricultural Engineer with many years of experience in the field. Throughout his career, he has worked on numerous projects aimed at improving agricultural practices and sustainability.

In addition to his BSc Ag Eng (Natal) degree, he has a Diploma in Management from UNISA and a Government Certificate of Competency in Mechanical Engineering.



From 1973 to 1976, Albert worked as an engineer at the Oenology and Viticulture Research Institute in Stellenbosch. He then worked as the Production

Engineer and Chief Engineer, and Factory Manager for sugar mills in Natal, until 1982, when he became the National Head of the Agriculture Department for Hill Kaplan Scott Consulting Engineers, based in Bisho, then Ciskei. Projects included land use study for the 1400 km² Buffalo River Basin, a national soil conservation strategy, Ciskei and Transkei rural development projects, including agro-industries (fruit juice, abattoirs, dairies), irrigation schemes, village market gardens, and marron aquaculture.

A move to Australia in 1986 saw Albert take on the role of Managing Partner at the Amberley Estate Winery in the Margaret River Wine Region. Making his mark in this industry until 1994, he then moved into Management and Development Consulting through the establishment of Albert Haak and Associates, for which he was the director until 2010. He then entered busy retirement!

Albert currently lives in Dunsborough, Western Australia. He is married to Bridget (nee Turner), has three children (Sarah, Kate and Andrew), nine grandchildren with ages ranging from eight years (Bridie) to 23 years (Nick). Albert enjoys all things outdoors, including wild camping and open-water swimming, and is heavily involved in local conservation efforts, including rewilding 7000 hectares of Cape Naturaliste.

Impact of Agricultural Engineering:

- “I learned that Agricultural Engineers can do anything!”

Inspirational Phrase

- “Fear nought”

Prof Peter Lyne

Graduation cohort: 1972

Peter started work in 1963, graduated with an electronics diploma in 1965 and worked for a short time before heading off to university to obtain a BScEng, MScEng, and PhD. Peter is still registered with the Engineering Council of South Africa and is a fellow of the South African Institute of Agricultural Engineers.



Peter chairs a sugarcane project for the industry, and has been doing consulting, some of it full-time. He remains involved with several National transport committees.

His interests have remained electronics and anything mechanical; having grown up on a farm, he put that interest to work in the field of Agriculture. He

specialised in mechanisation and spent most of his time at UKZN. During that time, he worked for two six-month periods for the United States Department of Agriculture and one six-month period for the University of Illinois. Upon retiring, he joined the South African Sugarcane Research Institute as Head of Engineering.

Peter and his wife, Ingrid, live in George, in the Western Cape. Between them, they have five children: Bruce in Australia, with two daughters, and Tanya in the United Kingdom, with a son and a daughter. The other three children are in South Africa: Craig in Salt Rock with one daughter, and two in Cape Town, Debbie with a son and daughter, and Mark, who does not have children. Ingrid keeps busy with housekeeping, sewing, knitting and making things for grandchildren.

Peter enjoys testing out his Jimny on all the mountain passes he can find and goes camping when time allows. He is on their Church Council with the maintenance portfolio, in other words, still doing DIY. Ingrid is an enthusiastic member of their off-roading and camping adventures. They just love the outdoors.

Impact of Agricultural Engineering:

- My university time taught me how to acquire knowledge, solve problems, work in teams and surround myself with people cleverer than I was.

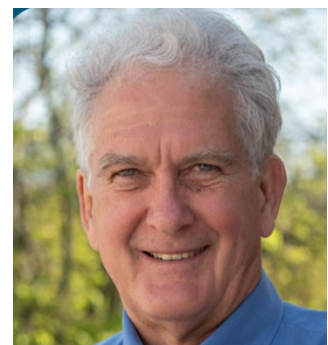
Inspirational Phrase

- "If you're in control, you are not going fast enough."

Dr Mark Dent

Graduation cohort: 1974, 1977 (MScEng), 1988 (PhD)

Mark is a dedicated Agricultural Engineer with over 50 years of experience since graduating in 1974. He earned a PhD in Engineering in 1988 and a Master's Degree in Business Leadership in 1996. He managed the Computing Centre for Water Research, a national facility funded by IBM and the Water Research Commission, for 16 years and served as Acting Director of the UKZN Graduate School of Business during the merger. Now a Senior Advisor with the International Alliance for Water Stewardship, he teaches water stewardship to corporate clients globally.



Mark Dent currently resides in Pietermaritzburg. He has been married to Kerry (née Mitchell) for 47 years. Kerry is a Pre-Primary teacher, and they have four

children: Lloyd (a dairy farmer), Roslyn (a psychologist), Kate (a lawyer and author), and Lynton (an engineer). Mark was active in Round Table for 14 years and in his church, where he led the Sunday School teaching for 31 years. He completed 18 Comrades Marathons and still runs regularly.

Impact of Agricultural Engineering:

- “My Bachelors, Masters & PhD studies all at UKZN have enabled me to hold my own amongst the best in the world.”

Inspirational Phrase

- “Tough times have been my best teachers”

Mr Erik John Schmidt

Graduation cohort: 1979, 1981 (MScEng), 1997 (MBL)

Erik has lived in Brisbane Australia since 2003. He is married to Diana; they have two sons, Karl and Cliff, who have their own families, including Erik's four granddaughters who they see regularly. He stays fit by running, cycling and hiking, enjoys photography, and is an active member of their local Kenmore Church community.



Erik graduated with a BSc Eng (1979) and MSc Eng (1981) and completed his MBL through UNISA in 1997. He enjoyed 22 years practicing Agricultural Engineering in South Africa, first in the Department of Agriculture, thereafter at UKZN, as a lecturer and research fellow, specialising in water resources and flood studies, then as Associate in a firm of consulting engineers, and finally as head of agricultural engineering at the South African Sugarcane Research Institute.

His family migrated to Australia in 2003, where Erik held a range of short-term positions in the sugar industry before spending 18 years as Deputy Director and Director of the National Centre for Engineering in Agriculture, University of Southern Queensland (UniSQ). Erik holds a Diploma from the Australian Institute of Company Directors and has enjoyed working throughout Australia and internationally (primarily in South and South-East Asia), in water resources, irrigation, and precision agricultural systems. He retired in 2021 but continues as an Honorary Industry Fellow at UniSQ and undertakes private consultancies focusing mainly on improving contract research performance. He has served on the ICID Australian National Committee and the Australian Society for Engineering in Agriculture and was proud to receive the Irrigation Australia 2022 award for outstanding individual contributions to the irrigation industry.

Impact of Agricultural Engineering

- "The skills obtained during my Agricultural Engineering studies at UKZN have provided a platform for me to improve agricultural systems, which have impacted many diverse communities across southern Africa and S and SE Asia."

Inspirational Phrase

- "Life's a journey, enjoy the ride, and keep God your guide"

Professor Jeff Smithers

Graduation Cohort: 1982, 1984 (MScEng), 1988 (PhD)

Jeff is passionate about Agricultural Engineering and has dedicated a great deal of his career to promoting and growing the Agricultural Engineering profession to make a greater contribution to sustainable environments and efficient agricultural production and processing systems. Much of his career has been at the University of KwaZulu-



Natal (formerly Natal), with his initial appointment as an externally funded contract researcher, progressing through the ranks to Professor of Agricultural Engineering and Head of School. In 2019, he was seconded by the School of Engineering to the uMngeni-uThukela Chair of Water Resources Research and Innovation, and he has served as the Director for the Centre for Water Resources Research at UKZN since 2019. He also holds Honorary appointments at the University of Southern Queensland in Australia and has a Global Chair appointment at the University of Bath in the United Kingdom. He maintains contact with industry by providing specialist support and mentorship to consultants on request.

Jeff is a registered Professional Engineer with the Engineering Council of South Africa (ECSA), a Fellow and long-serving member of the Council of the South African Institute of Agricultural Engineers (SAIAE) and has served as President of SAIAE. He is a founding member of the Pan African Society for Agricultural Engineering (PASAE) and served as the inaugural Secretary-General of PASAE until 2025. He continues to serve on the Executive Board of the International Commission of Agricultural and Biosystems Engineering (CIGR) and is an active member of the International Commission on Large Dams (ICOLD) Flood Evaluation and Dam Safety Committee.

Jeff has a wide range of research interests, which include design and engineering hydrology, soil and water conservation engineering, agro-

hydrological simulation model development and application, mechanisation planning and energy utilisation in agricultural production systems.

To date, Jeff has authored 65 peer-reviewed journal papers, 41 externally funded research reports, and 19 consulting reports. Through externally funded research projects, he has supported and supervised 15 PhD and 34 Master's graduates and has been invited as a keynote speaker at several national and international conferences with more than 117 conference presentations to date.

Jeff leads the National Flood Studies Programme (NFSP) in South Africa, which was established in 2016 to update and modernise methods used for design flood estimation and flood risk assessment in South Africa. The NFSP is an initiative of the South African Council on Large Dams (SANCOLD) and the Water Research Commission (WRC) and is supported by the Department of Water and Sanitation (DWS) and the National Roads Agency Ltd (SANRAL).

Jeff lives in Hilton, South Africa and is married to Kary (née Elliott), whom he met while she was studying Botany and Genetics in the Agricultural Faculty. They have two children, Jonty, an Industrial Engineer working in FinTech, and Bronwen, an Occupational Therapist working for the United Kingdom's National Health Service; both currently work and live in London. The Smithers family enjoys outdoor activities, including mountain biking, trail running, hiking, and camping. They are an active sports-playing family, participating in squash and tennis, and enjoy reading, bird watching and exploring while travelling locally and internationally.

Impact of Agricultural Engineering

- "The broad engineering training received in the multi-disciplinary fields of Agricultural Engineering, and the skills developed through postgraduate studies and work experience, have enabled me to work with confidence in a wide range of fields. It has been exciting to see the development of technology and the growing recognition and range of opportunities for Agricultural Engineers to make significant contributions to tackling challenges related to food and water security and sustainable environments."

Inspirational Phrase

- "Keep pushing the boundaries in all you do and make real-world impacts which inspire others"

Mr Patrick Furniss

Graduation cohort: 1985, 1988 (MScEng)

Patrick worked in the software development environment in London as a consultant after completing his MSc in Agricultural Engineering at the University. After returning to South Africa, he was extensively involved in the delivery of software solutions before joining Discovery in 2000. Whilst at Discovery, Patrick was accountable for setting up their operations environment; thereafter, he ran their managed care unit, DiscoveryCare. Finally, he took over the operations for Destiny Health, a US-based health insurer funded by Discovery. During this period, he completed a Senior Executive Programme at London Business School.



In 2010 Patrick joined Momentum Health where he was accountable for operations. Thereafter, he spent time in Mumbai, India, assisting in the setup of Aditya Birla Health Insurance, a partnership arrangement between the Aditya Birla Group and Momentum Metropolitan Holdings. On returning, he held the position of COO of Momentum Health and is now accountable for the Corporate Schemes Business Unit.

Patrick is presently based in Umhlanga, KwaZulu-Natal, although he travels extensively around South Africa for work. He is happily married to Fiona, whom he met whilst studying at the University, and with whom he shares two sons, Ciaran and Liam, who are currently based in London and Vienna. He is involved with a project sponsored by Citizen Lab, which entails mentoring a headmistress of uThongati Primary School. Fiona is a dance teacher and vice chairman of the Youth Education and Support (YES) Trust. Patrick and Fiona love travelling, exploring, and visiting their sons overseas.

During his spare time, Patrick enjoys mountain biking, canoeing, cooking and wine tasting.

Impact of Agricultural Engineering

- "Other than the first two years after graduating, when I was employed as a Research Fellow in the Agricultural Engineering faculty, I have unfortunately not been directly involved in the field of engineering. However, engineering did create a base for a number of projects that I was fortunate enough to get involved with in my working career."

Inspirational Phrase

- "True collaboration isn't possible without curiosity"

Mr Eric de la Harpe

Graduation cohort: 1986, 1988 (MScEng)

Eric holds an MSc in Agricultural Engineering, first working for John Deere and later joining the Agricultural Engineering Department as a staff member – a role he deeply valued. He transitioned to environmental engineering with Anglo American in Johannesburg before moving to the United Kingdom to teach computing at a private boarding school. That shift led him into software engineering, including working under the eBay umbrella.



Eric is now retraining as a fitness instructor purely for enjoyment. He lives near Oxford with his wife Ruth, a local he recently married. He has two sons from a previous marriage: Robbie, an economist in London, and Jonty, a geologist now retraining as a data analyst. Both are avid adventurers, recently hiking the Caucasus in the only stretch that avoids Russia. Eric and Ruth enjoy walking in the UK countryside; the public paths are a national treasure. He became politically active after the Brexit vote and now serves on his local Council, focusing on climate and well-being initiatives.

Impact of Agricultural Engineering

- “My time in agricultural engineering laid the foundation for my software development skills and shaped much of my career path.”

Inspirational phrase

- “Happiness is not about having what you want, it's about wanting what you have.”

Mr Ryan Cameron Giles

Graduation cohort: 2003, 2009(MScEng)

Ryan Giles is a registered Agricultural Engineer and a Fellow of the South African Institute of Agricultural Engineers, with 25 years of experience across agriculture, logistics, finance, and mining. He leads Leapfrog International, a strategy and innovation firm helping organisations improve operational performance in developing world markets. Previously, he served as Managing Director at Crickmay, where he led major transformation projects across Africa and was a founding executive of Forward Finance, a specialist agri-finance business. Ryan was recognised in 2024 as one of the *Top 10 Visionary Leaders Shaping the Future*. He holds a Master of Science in



Engineering from UKZN, an MBA (*Cum Laude*) from Hult International Business School, and executive certifications from Harvard Business School and MIT.

Ryan Giles resides in Hilton in KwaZulu-Natal, South Africa. He is married to Sarah, and together they have two children, Alex and Emily.

Impact of Agricultural Engineering

- My UKZN education instilled a systems-thinking mindset and practical problem-solving approach that underpin my work in engineering, finance, and innovation.

Inspirational Phrase

- "Make the impossible, possible."

Dr Ashiel Jumman

Graduation cohort: 2005, 2009 (MScEng), 2016 (PhD)

After living in Durban for 15 years, Ashiel now resides in Pietermaritzburg and is a Senior Lecturer in the Agricultural Engineering Discipline at UKZN. Ashiel's primary research and lecturing roles are in the fields of irrigation engineering and soil and water conservation engineering. Prior to joining UKZN in May 2023, Ashiel acquired 13 years of experience as a Research Engineer at the South African Sugarcane Research Institute (SASRI). During this period, Ashiel completed his MSc and PhD in Engineering degrees. His Master's project focused on the development of a modelling framework to improve irrigation design and management strategies to address ongoing challenges in water and energy, while his PhD work ventured into the complex dynamics of social systems and adoption processes in Agriculture. Ashiel has not only produced several publications and conference presentations but also received a number of awards both locally and internationally.



Ashiel is also registered as a Professional Engineer with the Engineering Council of South Africa and continues to serve on professional bodies at the KwaZulu-Natal branch and national level.

Ashiel is passionate about his work and earnestly strives to make the world a better place.

Impact of Agricultural Engineering

- "Considering the problems facing the world, such as unreliable and increasingly expensive supplies of food, water, electricity and fundamental infrastructure, Agricultural Engineering equips us to make

meaningful contributions. It is an incredibly noble and rewarding profession. In addition, the pedigree and character of the people in this profession is remarkable. The leadership, mentorship and sincere collective effort to address serious problems is worthy of high praise and celebration. “

Inspirational Phrase

- "The future depends on what we do in the present" Mahatma Gandhi

Ms Keamogetsoe Ipeleng Maroo-Maseko

Graduation cohort: 2008

Ipeleng is a Registered Professional Engineer with the Engineering Council of South Africa and a dedicated Agricultural Engineer with over 16 years of experience in research, engineering design, project management, and sustainability. She has worked at the Agricultural Research Council and is currently based in the Mpumalanga Department of Agriculture, where she has conceptualised and implemented impactful projects. Her expertise includes agricultural engineering design, sustainable agriculture, project management, youth empowerment, risk assessment and mitigation, as well as construction supervision. She has held leadership roles, including two terms as National Vice President of SAIAE. She is the current SAIAE Mpumalanga Branch Chairperson. Her international exposure spans training and missions in China, Germany, Egypt, Serbia, the United Kingdom, and the United States of America.



Ipeleng Maroo-Maseko currently resides in Emalahleni, South Africa, where family plays a central role in her life. She is especially proud of her son, Tshepo, an inquisitive seven-year-old who sometimes joins her on project sites, eager to observe the world of engineering firsthand. Ipeleng strives to set an example for him by living out values of resilience, excellence, and service, inspiring him both technically and socially. Together, they enjoy exploring new ideas, spending time in nature through hiking and camping, and strengthening bonds within their community through active service and involvement in church life.

Impact of Agricultural Engineering

- Her UKZN Agricultural Engineering foundation equipped her with strong technical and problem-solving skills. Building on this, she completed an MEng in Engineering Management at the University of Pretoria and an MSc in Sustainable Agriculture at the University of the Free State,

integrating engineering, management, and sustainability to bridge research, policy, and practice.

Inspirational Phrase

- "Strive to thrive."

Mr Mxanxathi James Mabadi

Graduation cohort: 2008

Mxanxathi Mabadi is a dedicated professional Agricultural Engineer and Project Manager with over 16 years of experience in the field as a qualified Engineer. He holds a BScEng in Agriculture from UKZN, an MSc in Project Management from the University of Pretoria, an MEng in Civil and Built Environment from the University of the Witwatersrand and is currently pursuing a PhD. He was employed as a professional development student under the Agricultural Research Council's Institute for Agricultural Engineering between 2006 and 2008. He currently serves as the Chief Agricultural Engineer at the Gauteng Department of Agriculture and Rural Development (GDARD) and the Deputy President and Gauteng Branch Chairperson of SAIAE. Throughout his career, Mxanxathi has worked on numerous projects aimed at improving food security and sustainability, rural development. He has held various positions at GDARD, the National Department of Agriculture, the Free State Department of Agriculture and Rural Development, JG Afrika, the ARC-IAE, Thuso Civils and Agricultural Engineers, and E'tsho Civils, where he acquired significant experience across the full project lifecycle, from feasibility studies and farm assessments to design, and construction management of a wide spectrum of agricultural infrastructure projects, including but not limited to food and feed processing plants and packaging facility, dairy facilities, poultry and piggery housing, livestock handling facilities, irrigation systems, farm dams, and mechanisation planning. His expertise encompasses Agricultural Engineering, Water Resource Engineering and Management, Project and Construction Management, Land Use and Land Cover Management, and he is passionate about water, poultry, projects, and construction project management.



Mxanxathi currently resides in Pretoria, South Africa, and is happily married to Masego Mojanaga, with whom he shares five children: Thembinkosi, Vuyo, Bokang, Sindiswa and Sakhile. The family enjoys farming, cooking, baking, playing and watching documentaries together, and is actively involved in the community policing forum and fighting veld fires.

Impact of Agricultural Engineering

- “Engineering studies at UKZN has contributed to my career development.”
- “By understanding the Ecosystem better, Agricultural Engineers understand the soil, water, air, plants and all the living organism better. As a result, my career objective is to contribute largely to sustainable socioeconomic and environmental development that promotes national and regional integration, poverty reduction, and the upliftment of disadvantaged communities. I aim to do so through the provision of technical expertise in infrastructure development, with a particular focus on Integrated Water Resources Engineering and Management, Agricultural Infrastructure, Human Settlements, and National Policy Development.”

Inspirational Phrase

- “Respect and Justice to all mankind”

Mr Thabo Mavundza

Graduation cohort: 2010

Thabo is an Agricultural Engineer by training and currently serves as Managing Director at Westfalia Fruit. His career began as a mechanisation engineer at the Agricultural Research Council and has evolved through roles in engineering, operations, and executive leadership. Today, he leads a team of more than 3,500 people across Africa and oversees large-scale operations that support the continent's growing agricultural footprint. He serves on the Board of Directors level of four different subsidiaries, and as chair. He is registered with the Engineering Council of South Africa and chairs Engineering Advisory Boards at different universities. His work enables him to merge technical knowledge with strategic leadership to advance sustainable agribusiness.



Thabo lives in Tzaneen, South Africa, with his wife and two daughters. As a family, they enjoy travelling and spending time outdoors. Beyond work, he is involved in community initiatives that promote education and sustainable agriculture, especially in rural areas where opportunities can transform lives.

Impact of Agricultural Engineering

- Studying Agricultural Engineering at UKZN gave me the tools to think critically, innovate, and lead with purpose. Those lessons continue to guide my approach to problem-solving and leadership today.

Inspirational phrase

- “Lift as you rise; you can only get what you give.”

Ms Ellen Letsogile Thipe

Graduation cohort: 2011, 2014

Ellen is a dedicated Agricultural Engineer with over 20 years of experience in the field. Throughout her career, she has worked in the academic field, first as a technician and rising to lecturer at the Botswana University of Agriculture and Natural Resources. Ellen is currently pursuing a PhD in Mechanical Engineering at Stellenbosch University. Her PhD research involves a thermal analysis of greenhouse microclimate management incorporating solar solutions. She has published several research articles, with the most recent being "Greenhouse Microclimate Management and Solar Energy - A Review of Possibilities for Botswana amid Climate Change Challenges." She is a member of the Solar Thermal Research Group (STERG) at Stellenbosch University.



Ellen currently resides in Stellenbosch, South Africa. She has been blessed with one child, a seven-year-old boy named Arefa Jwaone. Her hobbies include hiking, baking, crocheting, and food processing (jams, marmalades, etc.). She is also actively involved in Stellenbosch International Fellowship, a Christian church supporting a diverse international community residing in Stellenbosch.

Impact of Agricultural Engineering

- “I would choose UKZN over and over again for factors like the close relationship between the department and the industry through the South African Institute of Agricultural Engineers. Agricultural Engineering studies at UKZN helped me to progress from a technical staff member to an academic staff member engaged in teaching, research, and curricula development.”

Inspirational Phrase

- "Per ardua", Latin for "Through difficulties"; overcoming challenges through persistence.

Dr lone Loots

Graduation cohort: 2023 (PhD)

lone is a professionally registered Civil Engineer with over 15 years of experience in the field. Throughout her career, she has worked on numerous projects aimed at improving urban flooding resilience. lone started her working career at a Civil Engineering consulting company. She is now employed at the University of Pretoria, where she teaches various undergraduate and postgraduate subjects on water supply, free surface flow hydraulics, and flood hydrology. She also conducts research on the hydrology and hydraulics of urban floods.



lone currently resides in Pretoria, where she is raising her four-year-old son, Thando. They enjoy hiking, bird watching, and game viewing on weekends and reading, going to the park, or playing Lego after school.

Impact of Agricultural Engineering

- “Even though I am from a Civil Engineering background, my time studying under the supervision of Prof. Jeff Smithers showed me new perspectives and approaches to challenges faced in both disciplines. “

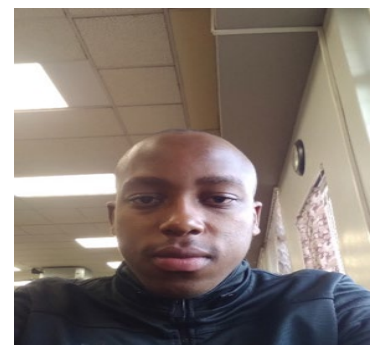
Inspirational Phrase

- “The same water that turns the mill of the wise man, erodes the soil of the fool.” (Translated from a saying by CJ Langenhoven)

Mr Melusi Khumalo

Graduation cohort: 2022

Melusi is a dedicated Agricultural Engineer registered as a Candidate Engineer with the Engineering Council of South Africa. He specialises in irrigation design, water management systems, and project management. With over three years of experience, he currently serves as an Irrigation Engineer at The Irrigation Company. Throughout his career, he has contributed to designing cost-effective irrigation systems for both small-scale and large-scale farmers, significantly improving crop yield and water conservation. His expertise includes irrigation design, precision agriculture, and project management. He is a member of the South African Institute of Agricultural Engineers (SAIAE) and the South African Irrigation Institute (SABI).



Melusi Khumalo currently resides in Pietermaritzburg, South Africa, focusing on his career development and personal growth.

Impact of Agricultural Engineering

- My studies in Agricultural Engineering at UKZN provided me with the critical technical foundation and problem-solving mindset essential for my career. The strong focus on practical applications, from soil mechanics to machinery design, taught me to approach agricultural challenges holistically. Specifically, the irrigation engineering module ignited my passion for irrigation, which has become my core specialisation. The degree didn't just teach me how things work; it taught me how to innovate and create sustainable solutions that have a real impact on communities and the environment.

Inspirational Phrase

- "Whatever your hand finds to do, do it with all your might."

Ms Lettie Masha

Graduation cohort: 2023

Lettie is a dedicated Agricultural Engineer and master's candidate at the University of KwaZulu-Natal, researching the *Impacts of Frequent Load Shedding on Milk Quality*. Her work focuses on promoting sustainable and resilient agricultural practices amid South Africa's energy challenges. She has been registered as a Candidate Engineer with the Engineering Council of South Africa since January 2024 and is currently part of the Professional Development Programme at the Agricultural Research Council (ARC). There, she gains hands-on experience in agricultural research, data analysis, and dairy sector interventions.



Lettie currently resides in Pietermaritzburg, South Africa. She is happily married to Zimele Ngcamu, and together they have one child, Ofentse Ngcamu. In her spare time, Lettie enjoys reading and working on carpentry projects.

Impact of Agricultural Engineering

- The skills acquired during my studies in Agricultural Engineering at UKZN have played a pivotal role in shaping my career. The strong foundation in engineering principles, research, and problem-solving equipped me to address complex agricultural challenges. It also opened doors to

professional networks and opportunities, enabling me to make a meaningful impact in both the private and public sectors.

Inspirational Phrase

- Hard work pays

Ms Riya Christel Daniel

Graduation cohort: 2024

Riya is a dedicated Agricultural Engineering graduate and a registered Candidate Engineer with the Engineering Council of South Africa, with a strong foundation in farm infrastructure design and water management. She is a member of the Golden Key International Honour Society.



Riya has gained practical experience through roles at MBB Consulting Engineers and academic projects, contributing to sustainable agricultural solutions and community initiatives. Her expertise includes farm infrastructure design, QGIS, AutoCAD, and water use licensing, and she is passionate about applying engineering solutions to enhance agricultural productivity and sustainability.

Riya currently resides in Pietermaritzburg, South Africa. She enjoys an active, independent, and creative lifestyle, with hobbies including painting, creating henna designs, reading, and going to the gym.

Impact of Agricultural Engineering

- Studying Agricultural Engineering at UKZN gave me the theoretical and fundamental knowledge that has shaped my career. It taught me how to approach challenges in farm infrastructure, irrigation design, and water management with a problem-solving mindset. Under the guidance of dedicated lecturers who helped me deepen my understanding and passion for the field, I gained skills that have allowed me to contribute to projects improving agricultural practices and sustainability. The lessons I learned continue to guide how I work and grow in my profession.

Inspirational Phrase

- "Creativity, curiosity, and persistence turn challenges into opportunities."

Mr Thalente Mpanza

Graduation cohort: 2024

Thalente is an Agricultural Engineer with a BSc in Agricultural Engineering from the University of KwaZulu-Natal, where he was recognised as the best-performing student in his second (2021), third (2022), and final year (2023) of study. He is currently pursuing a Master of Engineering in Mechanical and Mechatronic Engineering at Stellenbosch University, focusing on using CFD modelling to optimise agricultural packaging and the cold chain. His career journey includes a 12-month Farm Management internship in 2024 at Owen Sitole College of Agriculture in Empangeni, KwaZulu-Natal, where he gained valuable multidisciplinary experience across crop, livestock, and irrigation systems. In addition, he has contributed to academia as an assistant lecturer, teaching irrigation management and supporting student development. Thalente is working toward professional registration with ECSA as a Candidate Engineer, aspiring to become a registered Professional Engineer.



Thalente currently resides in Stellenbosch, South Africa. He cherishes close family bonds and enjoys spending time with loved ones. Outside of work and studies, he finds joy in outdoor activities that connect him with nature, such as hiking and exploring new places. He is also passionate about sharing knowledge and mentoring others.

Impact of Agricultural Engineering

- The skills he acquired at UKZN in problem-solving, design, and practical agricultural applications have played a key role in his growth in research, teaching, and professional development.

Inspirational Phrase

- “The impossible is only the untried.”

Mr Khulekani Mzuvukile Xolo

Graduation cohort: 2024

Khulekani Mzuvukile Sipiwe Xolo is an Agricultural Engineer with less than a year of experience, contributing to projects that advance sustainable agricultural practices. He gained valuable exposure during his internship at the National Department of Agriculture, working on infrastructure design, irrigation systems, and project management. Currently, he is pursuing professional registration with ECSA as a Candidate Engineer while actively participating in professional engineering organizations. Open to diverse opportunities, he strives to broaden his expertise across the field of agricultural engineering.



Khulekani resides in Pretoria, South Africa. He is family-oriented, values close relationships, and enjoys reading, sports, music, learning new skills, and spending time with loved ones. Passionate about nature and outdoor exploration, he also engages in community initiatives through local events, fundraisers, and student mentorship.

Impact of Agricultural Engineering

- My studies at UKZN enhanced my problem-solving, communication, and teamwork skills while providing technical knowledge in irrigation design, soil conservation, agricultural structures, CAD, and data analysis. These competencies continue to shape my career and will support my ambition to create meaningful impact within the agricultural sector.

Inspirational Phrase

- "Don't stop when you're tired, only stop when you're done."

Launch of Agricultural Engineering @UKZN Support Endowment

The Discipline of Agricultural Engineering at the University of KwaZulu-Natal (UKZN) holds a distinguished place in South Africa's academic and agricultural landscape. As the only South African university offering an accredited Bachelor of Science in Agricultural Engineering degree, UKZN has been instrumental in shaping the profession nationally and advancing sustainable agricultural practices across the continent.

As we celebrate 75 years of the Agricultural Engineering discipline at UKZN, which has trained and graduated Agricultural Engineers for 70 of those years, we honour a legacy that has enriched communities, empowered innovation, and strengthened food systems across southern Africa. In recognition of the value our work has added to the agricultural sector over these decades, we are creating a pathway for those who have benefited from the discipline's teaching and research to contribute to its long-term sustainability.

To this end, we have established an Agricultural Engineering @UKZN Support Endowment Fund to receive donations from alumni, industry collaborators, and friends of Agricultural Engineering at UKZN. The Fund is intended to support the future of the discipline at UKZN and ensure its continued relevance and contribution to engineering excellence to sustainable agricultural production, processing, logistics, water use productivity and efficiency while sustaining and regenerating the environment for future generations.

The income generated by this endowment will be used to:

- maintain academic excellence and ECSA accreditation of the Agricultural Engineering programme at UKZN,
- grow the impact and innovation of research output from the discipline,
- develop staff and student capacity, and
- support operational activities of the discipline.

The Fund will be administered by the [UKZN Foundation](#), a SARS-approved Section 18A Public Benefit Organisation (PBO). This means taxpayers in the Republic of South Africa may deduct up to 10% of their taxable income through donations to the Fund.

Whether you are a graduate of the Agricultural Engineering programme, a stakeholder in agricultural innovation, or someone who believes in the power of engineering to solve real-world problems, your support will contribute to the training of future generations of Agricultural Engineers and research focused on critical real-world issues which support and sustain life on the planet.

To contribute any amount of your choice to the
Agricultural Engineering @UKZN Support Endowment,
please click [here](#).

Then click on “**Donate now**” and select the **Agricultural Engineering
Endowment Fund project**.

List of Journal Publications

1. Abiy, AZ, Lagerwall, GL, Julian, P, Aguirre, NM and Davis, SE. (2025). Phosphorus Trends and Hot Spots—a Spatio-Temporal Data Analysis of Phosphorus Derived from Everglades Agricultural Area (Eaa) Farms (Florida, USA). *Environmental Monitoring and Assessment* 197 (4). <https://10.1007/s10661-025-13794-0>.
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