

GRATIA

1st Edition 2025



ABOUT THIS ISSUE

Feature story



Research Excellence



Academic Programmes



University Life



Community Engagement & Partnerships



Student Excellence



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Highlights



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Gratia 1st Edition 2025

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As we reflect on the achievements and growth that have occurred within the CUT community during the first semester, we pause to reflect on the incredible journey we have shared as a community. From innovative research breakthroughs to outstanding student accomplishments and Alumni excellence, the university continues to thrive as a hub of intellectual curiosity and creativity, proving once again that CUT is more than just a university, but a place where ideas come alive, people grow, and potential is unleashed.

We have navigated challenges and celebrated successes, all while pushing the boundaries of knowledge and understanding. We have seen remarkable things happen over the past months. Our alumni, staff, and students have continued to excel in academics, research, and extracurricular pursuits, from research breakthroughs and winning national and international competitions to publishing in prestigious journals. These accomplishments have not only brought pride to the university but have also set new standards for those who follow.

Our academics have remained the backbone of our university, ensuring that learning and teaching, mentorship, and scholarly inquiry remain vibrant and impactful. We are particularly proud of the interdisciplinary collaborations that have emerged, reflecting our commitment to knowledge that transcends traditional boundaries.

Congratulations to our recently graduated students on reaching their milestone. You have left our halls with not just a diploma or a degree, but with the values and skills to shape your communities and beyond.

You have demonstrated exceptional academic excellence, showcasing your skills, knowledge, and passion in your chosen fields. As you proceed into your career paths, take your expertise and enthusiasm to the workforce and make meaningful contributions to the industries.

We honour your accomplishments and acknowledge the support of your families, friends, and the university community. Your success is a testament to the university's commitment to fostering growth, innovation, and excellence. We also encourage you to remain lifelong learners and ambassadors of our great institution.

As we look ahead, we are excited to build on the momentum of the past semester and continue to uphold the values that define us.

In this edition, you'll find stories of inspiration, our groundbreaking research, our academic and students' excellence and our alumni achievements. We hope you will enjoy reading about the highlights of our semester and get a glimpse into the vibrant life of our university community.

At CUT, we continue to empower young minds and shape their futures.

Editorial Team

Prof. Dube talks about career ownership and advancement at the HERS-SA Emerging Women Leaders Programme



Prof. Pamela Dube, Vice-Chancellor and Principal, highlighted the importance of Higher Education Resource Services South Africa (HERS-SA) in fostering an inclusive and equitable academic environment, particularly in its pursuit of gender equity and transformation within higher education.

She was among the women in academia from across the country and other African universities who joined the inclusive HERS-SA Emerging Women Leader Programme (EWLP) for Women in Higher Education. With its focus on diversity and inclusivity, this programme welcomed women from diverse backgrounds and experiences, fostering a supportive community for women's leadership in academia.

The EWLP, held in Cape Town from 4 to 7 May 2025, was themed 'Resilience and Mental Toughness: Al to enhance productivity and well-being, building resilience and your personal journey to become the leader you emerge to be.' It focused on personal growth and resilience and had a profound impact on the participants by empowering them with the skills and mindset to navigate their leadership journey.

With her unique perspective as the Vice-Chancellor and Principal, Prof. Dube delivered a compelling presentation titled "Investing in Yourself: Taking Ownership of Your Career Journey." Her insights on career advancement, obtaining doctoral degrees, and preparing for senior leadership roles in higher education significantly contributed to the event, providing attendees with valuable strategies and a fresh outlook on their professional paths.

HERS-SA, a registered non-profit organisation, was formed with a clear mission to address the critical shortage of women in senior positions in the South African higher education sector. The organisation's efforts are crucial in promoting gender equality in leadership roles.

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PDTS Develops Customised Cranial Protection for an epileptic learner



Happy face: A life-changing moment for the Visage son from Pholoho Special School as he fits his new protective helmet from PDTS

Innovative Solutions for Real-Life Challenges

When the Medical Device Product Development unit at Product Development Technology Station (PDTS) learned about a child with epilepsy at Pholoho Special School in Bloemfontein facing constant risk of head injuries during seizures, we knew we had to take action. Recognising the impact such a condition can have on both the child and their caregivers, PDTS saw an opportunity to develop a customised solution to improve the learner's quality of life

Collaboration with the Pholoho Special School Community

Understanding the specific challenges faced by the child and their family was the first step. PDTS reached out to Pholoho Special School and engaged with the child's mother, Mme Nonkanzene Joyce Visage, and the teacher, Mme Conny Lesoli. Their insights and concerns provided crucial information that helped shape the design of a protective cranial helmet tailored to the child's needs.

A Customised Approach to Protection

While off-the-shelf cranial protectors are available, they often fail to meet the specific requirements of individuals with special needs. Recognising this gap, PDTS used advanced 3D scanning technology to design a custom-fitted helmet, ensuring both comfort and optimal protection.

Transforming lives through innovation

The impact of the Cranial Protector was immediate. As the child wore the custom-fitted helmet, a newfound sense of security was evident in the mother and teacher. The child himself experienced greater confidence and freedom, no longer constrained by the constant fear of injury.

The success of this initiative has extended beyond the school, positively influencing the child's family and the broader community. This project is a testament to the power of collaboration, innovation, and design driven by empathy. By listening to the needs of the community and applying technological expertise, PDTS has developed a life-changing solution that enhances safety and independence for children with epilepsy.

This initiative highlights the potential of technology stations to make a tangible difference in people's lives. The Cranial Protector stands as a symbol of what can be achieved when technology and community needs align to create a meaningful impact.



Key Features of the Cranial Protector: includes

- Shock-absorbing materials to minimise head injury risks during seizures.
- Adjustable straps and padding to ensure a snug yet comfortable fit,
- Removable face shield designed with clear resin and cutouts for the eyes, nose, and mouth, attached via Velcro straps,
- Perforated Design to enhance airflow and reduce heat buildup for added comfort and
- Vibrant colors and fun patterns to encourage children to wear their helmets with pride and confidence.

In an interview with the mother Ms Nonkanzene Joyce Visage, she was asked about her biggest fears and concerns before her son received the cranial protector, and this is what she said:

"As a mother, my biggest fear for my son was the possibility of a fatal head injury during a seizure. He falls without warning, sometimes while walking, playing, or even just standing. Every time he fell, I would be terrified that he would hit his head on the floor or furniture. I was constantly living in fear of possible serious injuries. I was desperate for help and protection. I was desperate for his safety and security.

The helmet has made a big difference for both my child and me. He is now able to play and move around more freely, and lately, I worry less about him hurting his head when he falls. As a parent, it gives me so much relief knowing that he has that extra layer of protection. It has made our daily life less stressful, and I feel more confident letting him explore and enjoy his childhood.

How does your child feel about wearing the helmet?

At first, he didn't really like wearing the helmet. He felt different from other children and didn't fully understand why he had to wear it. But with time and encouragement, he started to accept it. Now he wears it without complaining, especially because he knows it helps keep him safe. It fits him well and seems comfortable, even when he wears it for long periods. As a parent, it is comforting to know that he's protected and still able to enjoy his day without discomfort.

What was your reaction when you first saw the custom helmet?

I was really happy because I knew the helmet would protect him. It gave me a sense of comfort knowing that he would be safer, especially when he falls. Just seeing it made me feel like I could finally breathe a little easier.

Have you noticed any changes in how others (family, friends, community) interact with or support your child since receiving the helmet?

Yes, I have. At first, some people were curious and didn't understand why he needed the helmet. But once I explained, they became more supportive and careful around him. Our family and close friends have been very encouraging; they've even helped him feel more confident by reminding him of his bravery and strength. I think the helmet also makes people more aware of his condition, and that has helped create more understanding and kindness around him.

Is there anything you would like to see improved or added to the helmet in the future?

l understand that the helmet was developed specifically to protect his head, which it does very well. However, now he's still falling and sometimes injuring his knees. It would be helpful if, in the future, protective gear could be designed for other parts of the body as well, to give him an overall sense of safety.

How did seizures affect the child's participation in class before the helmet?

Epilepsy causes sudden seizures that can happen anytime. The learner sometimes has attacks while standing or sitting. This puts them at risk of falling and hitting their head on things like a desk, chair, or the floor, which could lead to serious injuries like a head injury or even bleeding in the brain.

Asked if she has observed any changes in the child's confidence or engagement since using the helmet, Ms Lesoli said with the helmet on his head, the learner knows that he is protected, which makes him more comfortable playing with other children without worrying about falling and getting hurt.

How have the other learners responded to the helmet? Has it influenced their understanding or empathy?

Other learners have witnessed him falling due to epileptic attacks, so they have more empathy and understanding of why he is wearing the helmet to protect his head, and no one is making fun of him, which is heartwarming.

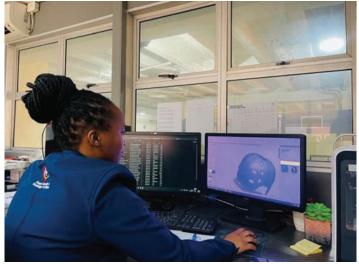
Is the helmet easy to manage during school hours (e.g., putting it on, taking it off, cleaning)?

Yes, because during therapy he takes it off himself and puts it back on afterwards. He seems content with his routine.

Has the helmet enabled the child to participate more fully in school activities?

Yes, he plays well with other learners during break time.

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The conceptualising and CAD design of the Cranial Protector. From manufacturing and painting to the finished product, the PDTS managed to customise a helmet that is light and breathable, suitable for a playing kid.

Were you involved in giving feedback during the design process? If so, how was your input used?

Yes, the engineers involved me in the entire process from the initial fitting to the final issuing of the helmet. They asked for my opinion on the design, including measurements around the face, comfort, and safety, as well as my preference for the colour, she smiled.

What inspired PDTS to take on this specific challenge?

The PDTS approached Pholoho Special School in Bloemfontein to identify potential projects for development. A learner at the school with severe epileptic episodes was identified, he was in danger due to frequent epileptic episodes, and he would hit his head to a point that it would swell up. The learner had a generic helmet made by the hospital, which was unappealing and uncomfortable for use. We then decided to take on the challenge of providing the learner with a custom-made that would be fit to size, comfortable to wear all day, aesthetically pleasing and functional.

What were your biggest technical or design challenges in creating this custom cranial protector?

The challenge we faced was taking accurate head measurements, translating them into the Computer Aided Design (CAD), FDM 3D and then printing the helmet. We also tested the fit before using the final SLS 3D Printing method.

Our other challenge was to ensure that we used a 3D printing method that would be durable enough to withstand multiple falls from a one-meter height. We had to drop the printed sample from that height to test whether the material could handle the impact.



The helmet fitting: Ms Conny Lesoli, little Visage's teacher, said she is happy for the little boy's helmet and relieved that his safety is certain.

How did 3D scanning and other technologies contribute to the success of the helmet?

3D scanning is a process where a handheld device is used to capture 3-dimensional (3D) data creating a 3D shape in CAD software. This process allowed us to capture the shape of the learner's head, enabling us to design the helmet around that 3D shape. The process provided accuracy and support through measurements, making it easier for us to design a perfectly fitting helmet

As designers and manufacturers, how did feedback from the mother and teacher influence the final product?

The mother and the teacher had a great influence in the final product as they are constantly around the learner and know his needs. They provided us with vital information that contributed immensely to project, including the learner's favourite colour and his previous experience with the heavy and unbreathable helmet.

Are there plans to make similar helmets available to other children with epilepsy or special needs?

Yes, we are currently working on another helmet for another learner at the school, and it is a fulfilling experience to make a difference in people's lives and put a smile on their faces.

What other assistive devices or projects is PDTS currently working on?

There are multiple projects daily, but due to IP reasons and client project confidentiality, we are unable to share the majority of our projects until they are at an advanced stage or if the client permits us to do so.

CUT-A university that unleashes potential and nurtures talent, a home for entrepreneurs and innovators



Mr Aphiwe Sogiba is hard at work, taking us through his day-to-day process of water purification.

The Central University of Technology (CUT) not only produces work-ready graduates but also nurtures entrepreneurs and innovators who are ready to tackle real-world challenges.

Meet Aphiwe Sogiba, a CUT alumnus and hydrologist at Vaal Water. Sogiba exemplifies this philosophy, demonstrating how a degree serves as just the starting point for a journey of continuous upskilling and entrepreneurial drive.

Aphiwe Sogiba shares his journey.

Sogiba's journey at CUT began with a Bachelor of Science in Hydrology and Water Resources Management. His passion for hydrology was driven by his understanding of the effect of water scarcity and the importance of having clean, drinkable water, which prompted him to pursue a career field where he could make a significant impact. "With the increasing water scarcity, I knew I had to study a water engineering course to make a difference."

Home is where the spark is



The laboratory where innovations are born

Born in Mthatha in the Eastern Cape Province, Sogiba's passion for studying Hydrology emerged from his desire to tackle the issue of waterborne diseases stemming from boreholes, rivers, and spring water in the village of eNocra near Cofimvaba. "In my village, we rely on these sources for our drinking water. My province experienced water scarcity long before the rest of the provinces did. We also have many villages that lack access to clean running water, and communities that still rely on rivers and dams for drinking and other purposes. The scary factor about contaminated water is that people can really get sick and ultimately die." Initially, Sogiba said he intended to pursue a degree in Geohydrology; however, it was not offered at other universities, prompting him to apply for a BSc in Hydrology and Water Resources Management at CUT.

Where the journey of new discoveries and endless possibilities began



Aphiwe mentioned that CUT's commitment to instilling the culture of entrepreneurial thinking was instrumental in his academic journey. "With the encouragement, guidance and support of my lecturer, Dr Johan Raath, Senior Lecturer: Electrical Engineering, I participated in a competition that challenged students to solve real-world issues. Together with my team from Just Energy Solutions (JUSI), we participated in the Eurydice Acceleration Program in Cyprus, where we presented cutting-edge renewable energy concepts. That is when I realised that a degree is just a foundation, not a ceiling, CUT empowers its students to embrace continuous learning and upskilling, identify industry gaps, and transform challenges into opportunities. I think it is important for students to tap into entrepreneurship and find solutions in their respective fields instead of waiting for jobs."

Applying the acquired knowledge and making an impact

Working at the Vaal Water, he identified the effect that loadshedding has on production at the water plant, and this became his catalyst for innovation. To address this challenge, Sogiba decided to enhance his hydrology skills by obtaining a Higher Certificate in Renewable Energy, also at CUT. This pivotal decision not only broadened his expertise but also ignited his entrepreneurial spirit. Leveraging his newfound knowledge of renewable energy, he conceptualised a solar-powered water treatment system with energy storage capabilities. This innovation ensures that water purification processes remain uninterrupted during power outages.

Research Excellence

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The day when Sogiba acquired his official status as a CUT Alumnus was a day when he entered a journey of new discoveries and endless possibilities.



His involvement in renewable energy projects extends beyond conceptualisation, he participated in a solar installation project where he is currently employed, contributing to its self-sustainability. His journey is a testament to how CUT nurtures innovative thinkers who are prepared to tackle contemporary challenges through continuous learning and adaptation.

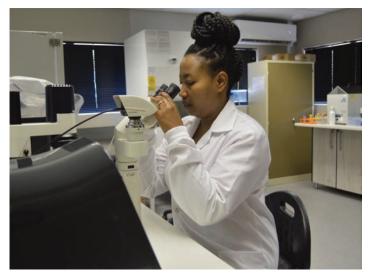
"I am grateful to CUT for the exposure and a chance to learn from other countries. The university offered me the platform I needed to present my ideas to investors, connecting me to industry leaders. Today I stand tall among my peers, and I am grateful for this opportunity. I can put bread on my table and take care of the people close to my heart," said Sogiba.





Aphiwe Sogiba's daily routine at the plant laboratory, making sure that water is safe, clean and drinkable.

CUT doctoral researcher is a trailblazer in cancer treatment by integrating traditional therapies with modern science to promote holistic healing



lpeleng Kopano Rosinah Kgosiemang at the renowned Centre for Quality of Health and Living in the Faculty of Health and Environmental Sciences lab. She is seen here under the microscope where her innovative research began.

The Central University of Technology is proud to announce a significant advancement in cancer treatment, specifically targeting triple-negative breast cancer through the innovative integration of nanotechnology and traditional acupuncture techniques.

This research, led by Doctoral researcher Ipeleng Kopano Rosinah Kgosiemang, under the tutelage of esteemed Professors Mamello Sekhoacha, from the University of the Free State and Sitheni Mashele, from Central University of Technology, introduced a novel drug delivery system utilising Superparamagnetic Iron Oxide Nanoparticles (SPIONs). These nanoparticles are synthesised using an eco-friendly method that incorporates the anticancer properties of the medicinal plant Euphorbia tirucalli.

This groundbreaking method employs electromagnetism to guide chemotherapeutic agents directly to tumour sites. By combining SPIONs with targeted acupuncture points, the researchers have achieved enhanced drug delivery to cancerous cells while minimising damage to healthy tissues and reducing side effects. In experiments with a mouse xenograft model of triple-negative breast cancer, this approach demonstrated superior effectiveness in inhibiting tumour proliferation compared to the conventional chemotherapy drug doxorubicin.

"Cancer therapies have historically been associated with severe side effects due to their inability to selectively target cancer cells. This innovative research addresses these challenges by merging: Nanotechnology: Utilising SPIONs to magnetically direct drugs to tumours," said lpeleng.

She added that Traditional Chinese Medicine: Electroacupuncture enhances drug delivery precision through consistent stimulation of acupuncture points, promoting holistic healing while exerting inhibitory effects on tumour growth and metastasis. "This interdisciplinary approach not only advances biomedical technology but also highlights the value of integrating traditional therapies with modern scientific innovations."



Doctoral researcher Ipeleng Kgosiemang is adamant she will make a difference in the lives of cancer patients with her groundbreaking research.

"The implications of this research are profound. By focusing on precision, sustainability, and accessibility, this novel method offers hope for more effective treatments for aggressive cancers while significantly reducing chemotherapy toxicity. As further development and refinement of this technology continue, it holds the potential to transform cancer care globally. As CUT progresses in this innovative research, it reaffirms its commitment to advancing science and improving patient outcomes through the collaboration of exceptional researchers and scholars," said Prof. Samson Sitheni Mashele, Dean of Health and Environmental Sciences.



Dr Kgosiemang, Ipeleng Kopano Rosinah, MHSc (CUT) on her big day, hooding her is Dr Sally Dzingwa, Institutional Registrar.

CUT NRF Research Chair Status upgraded to Tier 1



The Central University of Technology (CUT) has achieved a significant milestone when awarded the prestigious South African Research Chairs Initiative (SARChi) status by the National Research Foundation.

The upgrade of the NRF SARChl Chair in Medical Product Development through Additive Manufacturing to Tier 1 demonstrates the NRF's ongoing support for research development. This advancement reflects a higher funding level aimed at enhancing effective research strategies at CUT and highlights its impact on both academia and the community it serves.

"We have invested many years in our Centre for Rapid Prototyping and Manufacturing, and we are proud to have been selected as the host for a Research Chair in Medical Product Development using Additive Manufacturing (3D printing technology)," said Prof. Pamela Dube, Vice-Chancellor and Principal.

This recognition shows CUT's exceptional research output and groundbreaking innovations in Medical Product Development through Additive Manufacturing (3D Printing Technology) over the years.

"Achieving SARCHi Chair status is a significant recognition for CUT as a leader in medical product development among higher education institutions in South Africa", said Prof. Wendy Setlalentoa, acting Deputy Vice-Chancellor: Research, Innovation and Engagement.

Over the years, the National Research Foundation has championed the SARCHi initiative to boost South Africa's research outputs and innovations across various fields supporting the national innovation strategy. The initiative stands out as highly competitive among all South African universities and research agencies and is awarded to institutions deemed leaders in selected fields.

"We are deeply grateful to the National Research Foundation for acknowledging and appreciating our pioneering work and the Centre for Rapid Prototyping and Manufacturing 's significant contribution to research and innovation in the field of 3D Printing technology," said Prof. Deon de Beer, SARCHi Chair at CUT.

For CUT, this Research Chair is awarded to the university in recognition of the phenomenal work the university continues to produce in this exciting field. By participating in SARCHi, Prof. de Beer and his team will make a significant contribution to the national innovation strategy and have a meaningful impact on the future of research within academia, thereby paving the way for breakthroughs and advancements in Additive Manufacturing.

"In the next five years, we will use our SARChI status to create new platforms with Additive Manufacturing (AM). This will enhance our research and innovation capabilities while offering internships for postgraduate students. By developing career pathways for young researchers passionate about innovation, we are ensuring a bright future for this field while boosting our expertise, said Prof de Beer."

Hosting the Research Chair by CUT is just one more achievement to add to its well-notched belts.

Professor Mfengwana bridges the gap between natural products and their potential application in modern oncology



Meet Prof. Polo-Ma-Abiele Hildah Mfengwana, an Associate Professor and Head of Health Sciences Department. Her academic focus is on discovering and developing novel therapeutic agents that harness the unique properties of indigenous flora to combat cancer. Her field of research includes preclinical research on anticancer drugs derived from medicinal plants, as well as Immunohematology research.

With a focus on the identification and characterisation of bioactive compounds in medicinal plants, assessing their efficacy and mechanisms of action against various cancer cell lines, her work not only contributes to the scientific understanding of traditional medicine but also bridges the gap between natural products and their potential applications in modern oncology.

Prof. Mfengwana has led several major initiatives, notably the establishment of a collaborative research network that engages local traditional herbalists, botanists, and organic chemists from other Universities (Nelson Mandela University and National University of Lesotho). "This initiative not only supports sustainable harvesting practices but also ensures that knowledge exchange benefits all stakeholders, particularly in enhancing the economic and health prospects of local communities," she said.

Her notable accomplishments encompass securing substantial funding for her pioneering research projects, mentoring several postgraduate students, and enhancing the scientific community's knowledge through her publications in esteemed journals.

Her commitment to advancing this field is further evident by her completion of the course in Manufacture and Registration of Herbal and Cannabis-Based Medicines, offered by the University of Pretoria. This achievement highlights her relentless pursuit of excellence and innovation, enriching her expertise in developing scientifically validated medicinal products. Currently, she is involved in the development of a chemopreventive treatment designed to supplement existing therapies, which is undergoing of registration with the South African Medical Research Council (SAMRC). Additionally, she is conducting preclinical studies to evaluate the in vivo anticancer activity of specific plants that have demonstrated promising results in preliminary in vitro tests.

Prof. Mfengwana's efforts align with the university's strategic vision of promoting research that has real-world applications and societal impact. Through her pioneering work, she contributes to the university's mission of leading in sustainable and innovative healthcare solutions, particularly in the realm of cancer research.

Her dedication to the field and the impact she has made on the development of new anticancer therapies have established her as a key figure in her department and an inspiration to both her colleagues and students.

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CUT Engineer, researcher and multi-award winner aims to shape the next generation of technologists and scientists



Professor Elisha Didam Markus is a highly driven individual with extensive industry experience and exceptional skills and expertise in Electrical Engineering and advanced research methodologies. His main research interests include but not limited to: Robotics, Artificial Intelligence (AI), Internet of Things (IoTs), Smart networks, control systems and assistive mobility.

He began his career in the Telecommunications industry as a Network/Switching Engineer, where he was responsible for the maintenance, commissioning, and decommissioning of Engineering projects including Network Switches, and Transmission networks.

Prof. Markus is currently leading several research, including Cooperative control of multiple robotic systems, assistive mobility systems, smart networks, IoTs and wireless communications. His other research interests include nonlinear control, assistive mobility, Differential Flatness, Telecommunications, and emerging technologies. His research has attracted funding of over R3 Million in the last five years. He has since signed memoranda of agreement between the university and industry to fund projects in smart networks.

He has also partnered with the University of Paris Saclay, France and The Smart Networks Collaboration Initiative, in collaboration with the Council for Scientific and Industrial Research (CSIR), to coordinate activities on smart networks at CUT. The project is envisioned to develop efficient and secure networks for future smart systems, such as smart cities, smart grids, and smart water grids. The collaboration has resulted in the development of human capacity and the next generation of technologists and scientists.

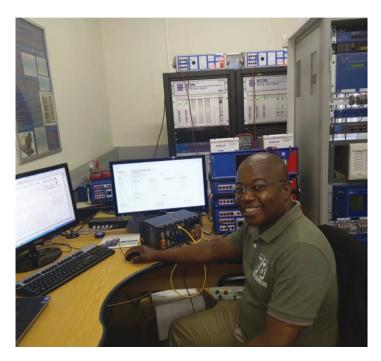
Furthermore, Prof. Markus has received several awards including the NRF Thuthuka award, early career and mid-career faculty research awards, Vice Chancellor early career research awards and Vice-Chancellor Innovation awards. He has also recently received NRF C2 rating for the period 2025-2030.

He is currently the interim chair of the university's artificial intelligence hub. He serves as a member of the following faculty committees: research and innovation, internationalization, community engagement, and the Centre for Sustainable Smart Cities. He is a Senior Member of the Institute of Electrical and Electronics Engineers (SMIEEE), and a Member of South African Institute of Electrical Engineers (MSAIEE). He is registered with the Engineering Council of South Africa (ECSA).

Prof. Markus has successfully supervised 14 master's and three Doctoral students, shaping research focusing on robotics, artificial intelligence, and smart systems. He is a frequent external examiner of master's and Doctoral dissertations in his field and a member of the board of examiners for such programmes at the University of Mauritius and Eduvos in South Africa.

He has authored approximately 100 publications, comprising peer-reviewed journal articles, book chapters, and conference proceedings. He is also a regular reviewer for many high-impact journals including Robotics and autonomous systems, Elsevier – Journal of the Franklin Institute, IEEE Transactions on Neural Networks and Learning Systems, and various MDPI journals. He also reviews Robotic conferences, such as: IFAC, PRASA-RobMech and IROS among others. In 2019, he served as Editor and Technical Chair for the IEEE Robmech-PRASA-SAUPEC Conference held at the Central University of Technology. He has also served as the Robotics and Mechatronics (RobMech) track chair of the RAPDASA conference for many years as well as TPCs for conferences locally and internationally. His scholarly work is currently registered on Google Scholar and Web of Science, with several of his articles widely cited in the fields of Robotics and Al.

Vice-Chancellor Award recipient advances global research on renewable energy security and smart grid protection



Professor Patrick Manditereza is a highly accomplished academic and engineer specialising in power systems, renewable energy integration, and protection systems. He is also a registered Professional Engineer with the Engineering Council of South Africa (ECSA), spanning over 30 years of experience in electrical engineering, combining industry expertise with academic excellence. His work encompasses advanced power system studies, postgraduate supervision, and cutting-edge research in renewable energy and protection.

His research addresses key challenges in modern power grids associated with the large-scale deployment of renewable energy technologies, including the development of advanced protection schemes for the modern power grid, strategies for enhancing power system stability in high-renewable penetration scenarios, energy optimisation and dispatch models to balance economic efficiency and grid security, and the application of intelligent monitoring and automation systems on power networks. His research further resulted in two patents US11482855B2 and GB2592147B being granted by the United States Patent and Trade Mark Office (2022) and the United Kingdom Intellectual Property Office (2023) respectively, for an innovative protection relay technology. These achievements demonstrate his contributions to global energy security and enhance South Africa's technological innovation capability.

Prof. Manditereza has secured over R1.5 million in research funding from entities such as the National Research Foundation (NRF) and the Technology Innovation Agency (TIA). His current NRF Thuthuka-funded project, "Renewable Generation Integration: Strategies for Mitigating Network Protection and System Stability Challenges", is developing solutions to improve the security and resilience of future renewable energy-dominant power grids.

His innovative contributions have been recognised with the CUT Vice-Chancellor's Excellence Award for Research Innovation (2023).

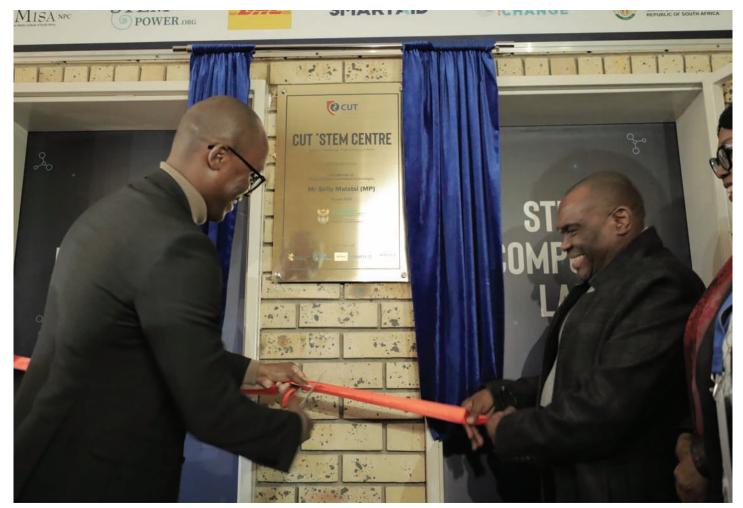
Prof. Manditereza has successfully supervised several Master's and Doctoral students, shaped future energy research, and contributed to the global discourse on renewable energy security and smart grid protection through more than 35 publications, including peer-reviewed journal articles, book chapters, and conference papers. He regularly serves as a reviewer for high-impact journals and has examined 13 master's dissertations and a Doctoral thesis to date in his field of expertise.

His innovative acumen has influenced his pedagogical approaches to teaching and learning where he has developed an innovative laboratory platform with remote capability that serves to address the problem of a high student-to-resource ratio and allows access to the lab from the lecture room, making it possible to seamlessly integrate theoretical and practical learning, enhancing student engagement and understanding of engineering concepts and applications. In addition, he has introduced industry-standard software and hardware tools, ensuring that CUT electrical engineering graduates acquire skills relevant to technologies that are at the forefront of power system developments and practices.

As the EWSETA Research Chair at CUT from 2021 to 2024, Professor Manditereza led a multi-faceted project funded by the Energy & Water SETA (EWSETA), aimed at enhancing skills development, research, and community engagement in renewable energy. He guided the development of industry-focused renewable energy training short courses on solar PV, wind power generation, energy storage, and health and safety. He successfully secured CPD accreditation for the "Renewable Energy" Technologies" short course through the South African Council of Educators (SACE). The course is targeted at STEM teachers and has been delivered in collaboration with the Free State Department of Education to teachers from various districts of the province. He also led a campaign with the tagline "Energy That Works for You", educating rural and peri-urban communities in the Free State and Northern Cape provinces on renewable energy and optimal energy use. Despite funding challenges, the EWSETA Chair initiative successfully laid a foundation for long-term renewable energy skills development and research innovation at

His research and academic contributions align with the university's strategic focus on innovation, industry collaboration, and sustainable development. His work in renewable energy integration directly supports the university's commitment to addressing energy security challenges, fostering technological advancements, and enhancing South Africa's transition to a sustainable energy future. Through the projects that he leads in research, community development, and industry partnerships, he is actively shaping the next generation of technologists, engineers, and researchers while contributing to South Africa's broader energy transformation goals.

Minister Malatsi officially launches CUT STEMPower Centre



Minister of Communications and Digital Technologies, Mr. Solly Malatsi, alongside Prof. David Ngidi, Deputy Vice-Chancellor: Teaching and Learning, officially cut the ribbon to mark the launch of the CUT STEM Centre.

The Minister of Communications and Digital Technologies, Mr. Solly Malatsi, officially launched the STEMPower Cyberlab at the Central University of Technology (CUT) on 13 June 2025.

In his address, he shared his profound vision that the launch of a space where innovation meets access and where young people can transform ideas into solutions will shape and change lives.

"We are not just building infrastructure; we are helping to build a more equitable future for all. My plea is that everyone who will be interfacing with the opportunities that emerge from this facility must share their knowledge with future generations. We must preserve it to ensure that it continues to touch lives, even those that are not yet part of the university. That way, we will be able to give true meaning to the power of digital innovation and changing lives through the power of digital connectivity," said Malatsi.

Prof. David Ngidi, Deputy Vice-Chancellor: Teaching and Learning added that the launch is not only a recognition of academic excellence but also a demonstration and commitment by the university to its STEM offerings.

"Honourable Minister, we are deeply grateful that your department has once again chosen CUT as a hub for national digital innovation. This follows our selection as one of the three founding institutions of the Artificial Intelligence Institute of South Africa and our impactful ongoing partnership with NEMISA. Together, we have already trained over 1,300 participants this year in digital and data literacy, including a group of 54 young girls from St. Michael's School; proof that we are reaching the heart of communities," said Ngidi.

STEMPower, DHL, NEMISA, Smart Aid, and Ripples for Change collaborated to build the cutting-edge facility, that will provide students and the surrounding community with valuable digital and STEM skills. It includes a fully equipped computer lab, a robotics centre, and a separate area for training young people in cell phone repair.

CUT champions responsible computing in Higher Education with the Mozilla Foundation initiative



Participants contributed innovative ideas and exploited the new wave of technological advancement while taking care of and protecting the environment. Pictured: CUT Vice-Chancellor and Principal, Prof. Pamela Dube (centre) with her executives and some of the partners and awardees from NRF, RCC, NEMISA, USAID, UCT, WITS, UWC, UP, UFH, DUT, Sol Plaatje University.

In today's rapidly evolving digital landscape, the Central University of Technology (CUT) is taking proactive steps to prepare graduates for the challenges and opportunities of tomorrow.

CUT hosted a pivotal Responsible Computing Challenge (RCC), an initiative of the Mozilla Foundation. This initiative aims to cultivate a new generation of tech professionals who approach technology design with a holistic perspective, driving a muchneeded shift in industry culture.

The initiative aims to unite experts and leaders in addressing the urgent need to integrate responsible computing principles into higher education. It focuses on designing, developing, and testing curricula that equip students with the knowledge to understand the social and political implications of technology.

Dr Luzaan Schlebusch, Senior Lecturer at the Welkom Campus is part of the cohort of awardees who have received a grant from the Mozilla Foundation for her work which focuses on developing a curriculum for future Computer Science educators that emphasises responsible computing. This remarkable project incorporates language inclusivity in technology education, focusing on languages such as Sesotho and Afrikaans, ensuring that technological learning is accessible to all students.

Dr Ziyaad Bhorat, Senior Advisor and RCC Country Lead for South Africa & USA, highlighted the importance of interdisciplinary collaboration in this endeavour. "We need to integrate various disciplines to prepare the next generation of tech leaders and practitioners. Technology creates new forms of positive connection and creativity; it also gives rise to challenges that can negatively impact communities of colour and marginalised groups," he said. He further emphasised the crucial need to understand the socio-cultural dimensions of Artificial Intelligence, as well as the importance of developing South Africa's educational workforce to effectively harness the opportunities and mitigate the risks associated with this technology.

A dynamic keynote panel discussion featuring Mr Trevor Rammitlwa, CEO of the National Electronic Media Institute of South Africa (NEMISA), and Prof. Pamela Dube, Vice-Chancellor and Principal provided further insights.

Prof. Dube articulated CUT's Vision 2030, which aims to establish the university as a leading African University of Technology. "Developing technologies that address real-world challenges and promote human dignity is paramount." She also highlighted the role of Al in fostering accountability and transparency, aligning with CUT's mission to ensure technology serves humanity's needs. "Participating in the responsible computing challenge will amplify our efforts in shaping a future where technology benefits humanity."

She also mentioned the importance of shaping the future of technology with a focus on ethics, inclusivity, and social responsibility. "I am particularly excited about Dr Luzaan Schlebusch's project, which has received recognition. Her remarkable project incorporates language inclusivity in technology education, and that is our philosophical approach at CUT."

Mr Rammitlwa detailed NEMISA's work in coordinating digital technology initiatives and delivering digital skills training across various educational levels. "We are collaborating with universities and TVET colleges to establish digital skills centres," explained Mr Rammitlwa. He emphasised NEMISA's focus on cybersecurity and responsible computing, ensuring both consumers and providers of digital tools act responsibly. He also emphasised NEMISA's commitment to collaborating with the government to integrate responsible computing into policy development and educational activities, thereby driving digital literacy and high-end skills development in South Africa. "We need responsible computing to be integrated into policy development and educational activities," he added.

The panel discussion concluded with a resounding call for continued efforts in interdisciplinary collaboration, responsible computing, and the development of digital skills. The panellists emphasised the need to integrate these elements into educational frameworks and policy development to ensure a sustainable and inclusive digital future for South Africa.

Celebrating milestones: CUT caps 20 doctoral graduates at both campuses

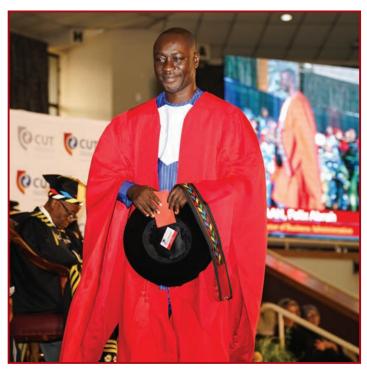
At the 2025 Autumn Graduations, 21 doctoral degrees were conferred, with three awarded at the Welkom Campus and 17 at the Bloemfontein Campus. Among them, an honorary Doctorate in Mechanical Engineering (honoris causa) was conferred to William Hlakoane, a Mechanical Engineer by profession and the current Denel Group Executive Landward.

The conferral of the doctoral degree represents the pinnacle of academic achievement, signifying the highest level of expertise in a chosen field. This prestigious qualification is an individual accomplishment and extends beyond academia and professional success, contributing to societal progress. It is a recognition of years of dedication, perseverance, and scholarly inquiry, marking the recipient's place among the world's leading thinkers and innovators in the ever-evolving world.

In total, 3,715 graduates from both campuses received their qualifications, including 38 who earned master's degrees.

Faculty of Management Sciences

Doctor of Business Administration



Dr. Felix Abrah Baah

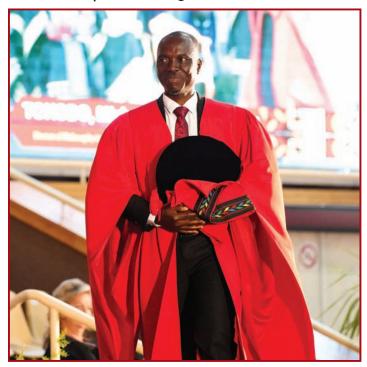
Promoter: Prof. P Rambe, PhD (UCT)

Topic: "Effects of organisational capabilities on entrepreneurial resilience of Free State emerging contractor firms: moderated mediation of environmental dynamism and innovation ambidexterity"

Dr Felix Baah contributed to entrepreneurial research by explaining the mechanisms through which organisational capabilities interact with environmental dynamism in shaping entrepreneurial resilience. Applying the Resource-Based View Theory, a deductive approach, and samples from emerging contractor firms in the Free State province in South Africa, he investigated the effect of organisational capabilities on the entrepreneurial resilience of emerging contractor firms, and the extent to which innovation ambidexterity and environmental dynamism mediate and moderate the relationship, respectively.

The research is envisioned to contribute to a deeper understanding of firm resilience, which can be used to promote positive entrepreneurial outcomes amongst small businesses.

(Human Capital Management)



Dr. Michael Tonneey Kwaku Tokodo

Promoter: Prof. C Chipunza, DTech (NMU)

Co-promoter: Dr LW Dzansi, BEd Hons (UFS), MPA (UFS), DTech (CUT)

Topic: "Development and empirical evaluation of a counterproductive work behaviour structural model for academics"

In his study, Dr. Todoko focused on the less-attended-to construct of psychological contract breach as a starting point to understand the psychological mechanisms that could explain incidences of counterproductive work behaviour amongst academics.

A model linking perceptions of psychological contract breach and other relevant constructs was developed and tested for fitness using structural equation modelling. The study established that the constructs of psychological contract breach, job insecurity, job stress, negative emotions, justice perceptions, and feelings of revenge all contribute to the occurrence of counterproductive work behaviour amongst academics.

The study is envisioned to make a significant contribution to employee work behaviour theory, as well as practical managerial strategies and policies aimed at mitigating counterproductive work behaviour among academics. An empirical paper from the thesis was published in 2024, while four others are at various stages of development.

Doctor of Philosophy in Management Sciences Doctor of Philosophy in Management Sciences (Business Administration)



Dr. Ntokozo Dlamini

Promoter: Prof. DY Dzansi, MA (UFS), MBA (PU for CHE), PhD (UP)

Co-promoter: Dr TC Dzogbewu, D Eng (CUT) Co-promoter: Prof. DJ de Beer, D Tech (CUT)

Topic: "Enhancing the economic sustainability of firms in the 3D printing business ecosystem: a strategic entrepreneurship perspective"

Dr Dlamini's research critically examined the economic sustainability of the Central University of Technology, Free State (CUT)'s 3D-printing business by identifying key industry success factors (KISFs) at national, continental and alobal levels.

The study employed the rigorous mixed-methods approach to provide an in-depth evaluation of the alignment of CUT's CRPM with these success factors. The findings highlight the strategic importance of regulatory compliance, sustainability, employee competence, supply chain optimisation, technological advancements, and cost-effectiveness in fostering long-term growth. Through insightful recommendations, she proposed an entrepreneurship framework that integrates market expansion. collaboration, and continuous innovation to enhance the economic resilience of CUT's 3D-printing business.

Two papers were published in the Department of Higher Education and Training (DHET)-approved journals.

(Business Management)



Dr. Nicholas Ofoe Ahadjie

Promoter: Prof. DY Dzansi, MA (UFS), MBA (PU for CHE), PhD (UP)

Co-promoter: Prof. CC Chipunza, DTech (NMU)

Co-promoter: Dr F Okyere

Topic: "Fostering rural community socio-economic resilience through small-scale Agribusiness: lessons from World Vision International Livelihood program in Lesotho"

Dr Nicholas Ahadiie's research examined the impact of resiliencebuilding initiatives by World Vision International in Lesotho. The study provides empirical evidence that these interventions significantly enhance participants' incomes and resilience, whilst identifying key barriers, such as limited knowledge, capital, and market access.

Using structural equation modelling, the research established significant relationships between socio-economic empowerment, individual resilience, and community resilience. Selected findings were published in the International Journal of Management, Accounting, and Economics (IJMAE).

Doctor of Philosophy in Management Sciences Doctor of Philosophy in Management Sciences (Public Sector Management)



Dr. William Kwadzo Dzineku

Promoter: Prof T van Niekerk, D Tech (CUT), MPA (US).

Co-Promoter: Prof DY Dzansi, PhD Entrepreneurship (UP), MBA

(NWU), MA in HES (UFS).

Topic: "The impact of multiple job holding on work-life balance, well-being, and primary job performance of public sector employees in Ghana: A case study in the Volta region"

Dr William Kwadzo Dzineku's research aimed to positively contribute to promoting employee work-life balance and wellbeing while also enhancing the performance of primary job responsibilities among public sector employees in Ghana who engage in Multiple Job Holdings (MJH).

The study proposed an integrated model to manage MJH in public sector institutions in Chana, emphasising the importance of employee incentive programmes that provide competitive salaries, career growth prospects, and recognition for dedication. Two articles from the study were published in accredited journals, whilst another one was accepted for publication in an accredited iournal.

Doctor Philosophy in Management Sciences (Entrepreneurship)



Dr. Tumo Paulus Kele

Promoter: Prof. DY Dzansi, MA (UFS), MBA (PU for CHE), PhD (UP)

Topic: "A process model for venture creation entrepreneurial success at the base of the pyramid: Integrating social bricolage and effectuation in resource-scarce environments"

Dr. Tumo Paulus Kele's doctoral research examined the critical role of bricolage in enabling entrepreneurs to sense, seize and transform opportunities within small and medium-sized enterprises (SMEs) operating in townships and rural areas.

His study provided significant theoretical and practical contributions. It also envisions enhancing academic discourse while offering valuable insights for entrepreneurs, policymakers and practitioners navigating resource-constrained settings.

The findings lay the groundwork for re-evaluating entrepreneurial theories in emerging economies, shaping future research and practice in the field.

Doctor Philosophy in Management Sciences (Entrepreneurship)



Dr. Galaletsang Gail Motlhaudi

Promoter: Dr.J. van Zyl, PhD (UFS)

Topic: "Factors affecting the performance of SMME incubates; Evidence from public incubators and incubates in the Northern Cape"

Dr. Motlhaudi identified the high failure rate of Small, Medium and Micro Enterprises (SMMEs) in South Africa as a great concern that undermines job creation, economic recovery, and societal rejuvenation, highlighting the need for performance support of these firms. The study investigated the factors that affect the performance of SMMEs supported by and operating in four Northern Cape public business incubators. Semi-structured interviews with incubator managers, focus groups with incubatees, and interviews with SMME owners were used as data extraction methods.

Her findings demonstrated the flawed conceptualisation of business incubation, and the insufficiency of services rendered, including a lack of crucial support structures for incubatees. The study recommended that incubators adjust their incubation models to enhance SMME outcomes by applying a framework coined the "Apprenteneurship Framework", which combines incubation with industry-specific mentorship.

Faculty of Humanities

Doctor of Communication in Language Practice Doctor of Communication in Language Practice



Dr. Papiso Irene Brown

Promoter: DR MC MOLETE: DComm Language Practice (CUT)

Topic: "Linguistic manipulation on Facebook during political and public unrests: A case study of Lesotho"

Dr Papiso Brown's thesis focused on the use of linauistic manipulation on Facebook political group pages during public and political unrest, employing a mixed methodology approach that included qualitative critical discourse analysis, quantitative descriptive statistical analysis, and thematic analysis. The findings revealed that the causes of Facebook public and political unrest include profane language, hate speech, victimisation, provocation, heated arguments, sarcasm, and intellectual bullying.

Her study recommended sensitising followers and the general public to Facebook challenges and educating them on the power of language in fake news and false information. Two articles have since been accepted for publication in Department of Higher Education and Training (DHET)-accredited journals.



Dr. Peace Fiadzomor

Promoter: Dr K Sebolai, PhD (UFS)

Co-promoter: Dr BG Fredericks; DTech (CUT)

Title: "Discourse analysis of abstracts of undergraduate students' research: an interdisciplinary investigation"

Dr Peace Fiadzomor's research investigated abstracts of undergraduate theses in nursing, medicine, and allied health sciences at the University of Health and Allied Sciences (UHAS) in Chana. It identified similarities in the structure and content of abstracts across these disciplines, noting variations primarily in the number of steps within the "Method" section.

Specifically, nursing abstracts typically comprised eight steps in the "Method" section, whilst allied health and medicine abstracts contained nine and ten steps, respectively.

The predominant use of material processes was observed in the "Introduction" section, followed by relational, mental, existential and verbal processes. This study contributed to genre theory by examining these abstracts produced by Ghanaian undergraduates, offering insights that could be valuable for academic writing instruction and future research endeavours across various disciplines

Doctor of Education



Dr. Nicole Charlene Drude

Promoter: Prof. JB Badenhorst, D.Ed (UNISA) **Co-promoter:** Dr CL Schlebusch, PhD (CUT)

Topic: "Teachers' perspectives on inclusive practices in full-service and ordinary mainstream schools: towards a support framework for intervention."

Dr Nicole Charlene Drude's study explored teachers' perspectives on inclusive practices in full-service and ordinary mainstream schools. Teachers showed high confidence in collaborating with families, co-workers and stakeholders to support learners, as well as in fostering inclusive classroom environments. However, they felt less confident in educating others about inclusion policies and adapting assessments, particularly for learners with autism spectrum disorders and minor cognitive impairments.

Challenges included a lack of practical training, insufficient funding, poor infrastructure, and limited community and parental involvement in implementing inclusive education. Based on these findings, she developed a framework for the successful implementation of inclusive education in South African schools. The study recommended that this framework be implemented by the Department of Basic Education (both national and provincial), districts, school management teams, and teachers.

Doctor of Education



Dr. Myameko Victor Pele

Promoter: Prof. G Schlebusch, PhD (Vista University)

Topic: "The state of multi-grade teaching in the intermediate phase in rural areas in the Free State province".

Dr Victor Pele's study explored multi-grade teaching in the intermediate phase (IP) in rural areas of the Free State Province, focusing on how teachers and principals manage such classrooms. Using a qualitative approach, open-ended questionnaires were distributed to teachers and principals; individual teacher interviews were conducted; and classroom practices were observed during site visits.

The findings of his study revealed that teachers have a limited understanding of effective multi-grade teaching and that subject advisor training is inadequate. The Curriculum and Assessment Policy Statement, intended for monograde teaching, does not suit multi-grade needs, leaving teachers without proper guidance. Issues such as time allocation, textbook shortages, lack of inservice training, high workloads, and unfavourable teacher-learner ratios compromise the quality of teaching.

Principals often fulfil dual roles as teachers and administrators. Collaboration between schools and the Department of Basic Education regarding multi-grade workshops is essential. An article from this study, co-authored by the promoter, was published in an accredited journal.

Doctor of Education



Dr. Ndoyisile Moses Majola

Promoter: Prof. W Setlalentoa, BEd Hons (NWU), MEd (UFS), PhD

(CUT

Co-promoter: Dr RW Thabane, PhD (CUT)

Topic: "Enhancing principals' leadership for sustainable learner success in the secondary schools in Motheo district"

Dr Ndoyisile Moses Majola's research focused on the impact of school principals in fostering learner success and developing competent teachers through effective teaching practice coordination at CUT.

His study investigated how principals in high-performing secondary schools in the Motheo district support low-performing schools in improving academic outcomes. By analysing the leadership skills, experiences and strategies of principals and deputy principals, the study identified challenges such as inadequate instructional leadership and systemic issues affecting performance.

Leadership challenges hindering academic success were identified through qualitative research. A framework was developed to enhance principals' leadership skills for sustainable academic improvement. Findings were shared at a conference and published in conference proceedings and a peer-reviewed journal, emphasising the role of leadership in educational equity.

Faculty of Engineering, Built Environment and Information Technology

Doctor of Engineering in Mechanical Engineering



Dr. Lehlohonolo Francis Monaheng, MEng (CUT)

Promoter: Prof. WB du Preez, PhD (US)

Co-promoter: Prof. C Polese, PhD (University of Pisa)

Title: "Redesign and characterisation of a nose wheel fork of a light aircraft for production in Ti6Al4V (ELI) by laser powder bed fusion"

Dr Lehlohonolo Francis Monaheng's doctoral research developed a structural aircraft component for Additive Manufacturing (AM) in titanium. He designed and experimentally validated a lightweight nose wheel fork for the Advanced High Performance Reconnaissance Light Aircraft (AHRLAC) using topology optimisation and finite element analysis.

Through a technology demonstrator, he demonstrated the feasibility of producing a high-strength, low-weight landing gear fork in Ti6Al4V(ELI) using laser powder bed fusion. Three peer-reviewed journal articles and two international conference papers emanated from this research. In partnership with Jonker Sailplanes, R2 400 000 was secured from the Department of Science, Technology and Innovation through the Collaborative Programme in Additive Manufacturing (AM) for applying additive manufacturing technology to selected sailplane components.



Dr. Joseph Nsengimana, Msc (KSPU)

Promoter: Dr JG van der Walt, DTech (CUT) **Co-promoter:** Dr EHG Langner, PhD (UFS) Co-promoter: Prof. DI de Beer, DTech (CUT)

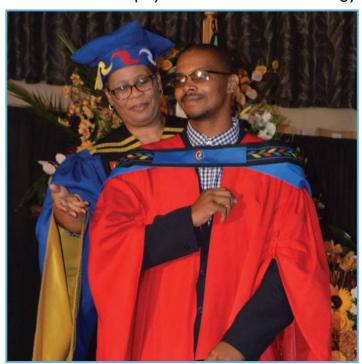
Title: "Investigating the production of polypropylene powder suitable for processing through laser sinter additive manufacturing"

Dr Joseph Nsengimana's doctoral study focused on the local production of polypropylene powder suitable for processing through the laser sintering Additive Manufacturing (AM) process.

Additive Manufacturing (AM), more commonly known as "3D printing", is recognised as one of the key enabling technologies in the Fourth Industrial Revolution. However, the high cost of feedstock materials limits the large-scale uptake of the technology for industrial applications.

Powder suitable for laser sintering that delivers parts with properties similar of those of commercially available powder could be produced at a significantly lower cost, while stimulating local industry development and countering the high cost of imported materials. Findings from the research were published in two international conference papers.

Doctor of Engineering in Mechanical Engineering Doctor of Philosophy in Information Technology



Dr. Makhetha John Nyetanyane, MIT (CUT)

Promoter: Prof. EMI Masinde, PhD (UCT)

Co-promoter: Prof. M. Tafadzwanashe, PhD (UKZN)

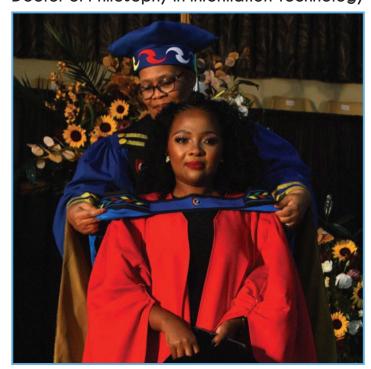
Title: "Application of indigenous knowledge, machine learning and satellite imagery to optimize cropping decisions by small-scale farmers: case study of Mgungundlovu District Municipality, South Africa"

Dr lohn Nyetanyane's doctoral research aimed to improve the way small-scale farmers predict seasonal changes and precipitation patterns by integrating indigenous knowledge with weather data, satellite imagery, and time series models.

This approach will help forecast rainfall and temperature shifts throughout the season. In response to the impact of climate change on crop health, he developed a machine learning expert tool that learns from both indigenous and scientific knowledge to assist farmers with crop-related challenges. Evaluated for crop selection, the tool demonstrated 83.3% accuracy rate, and it is expected to improve with more data.

The findings of his research highlight the potential of combining indigenous knowledge with science to enhance small-scale farming in the face of climate change. The research was shared through five accredited Department of Higher Education and Training (DHET) publications.

Doctor of Philosophy in Information Technology



Dr. Maingosinathi Paulina Phoobane, MSC (UFS)

Promoter: Prof. EMI Masinde, PhD (UCT) **Co-promoter:** Prof. T Mabhaudhi, PhD (UKZN)

Co-promoter: Prof. J. Botai, PhD (UP)

Title: "Development of an intelligent prediction model for infectious disease outbreaks: an ensemble of machine learning, big climate data and indigenous knowledge"

Dr Maingosinathi Paulina Phoobane's doctoral research addressed the challenge of infectious disease outbreaks in Sub-Saharan Africa. In this region, climate change and inadequate surveillance systems exacerbate the burden of disease. By integrating indigenous knowledge with machine learning techniques and big climate data, she developed a novel early warning system for malaria, achieving a prediction accuracy of up to 93% while ensuring greater contextual relevance.

Her study also investigated the potential of underutilised hydrological drought indices – the Effective Drought Index (EDI) and the Available Water Resources Index (AWRI) – in malaria prediction. Findings revealed that incorporating indigenous knowledge and drought indices enhances the intelligence of early warning systems and promotes community engagement, thereby empowering local communities in proactive disease prevention efforts.

Her research contributions were disseminated through four Department of Higher Education and Training (DHET) accredited publications, comprising two peer-reviewed journal articles and two international conference presentations.

Faculty of Health and Environmental Sciences

Doctor of Health Sciences in Biomedical Technology



Dr. Gloria Otito IZU, MSc (University of Ibadan)

Promoter: Dr Cl Chukwuma, PhD (UKZN) **Co-promoter:** Prof. SS Mashele, PhD (Medunsa)

Title: "Investigating the antidiabetic and antioxidative potential of peels from selected South African fruits"

Dr Gloria Izu's study employed research techniques in pharmacological, computational, chemical and biomedical disciplines to unravel the antidiabetic and antioxidant phytochemistry of the peels of avocado and litchi fruits.

Her study revealed the possible application of these fruit wastes in managing diabetes and its associated oxidative complications. She published three articles from her project and co-authored four other articles in peer-reviewed journals. She also presented the data from her study at the 56th Annual Conference of the South African Society for Basic and Clinical Pharmacology (SASBCP). Additionally, she was the recipient of the prestigious Dean's Trophy for the Faculty of Health and Environmental Sciences' best publication in 2024.

Doctor of Health Sciences in Biomedical Technology



Dr KGOSIEMANG, Ipeleng Kopano Rosinah, MHSc (CUT)

Promoter: Prof. MP Sekhoacha, PhD (UCT) **Co-promoter:** Prof. SS Mashele, PhD (Medunsa)

Title: "Targeted delivery of iron, cobalt and magnesium nanoparticles incorporating anticancer constituents of Euphorbia species for treatment of breast cancer"

Dr Ipeleng Kopano Rosinah Kgosiemang conducted a groundbreaking study on 16 Euphorbia species for their efficacy against aggressive triple-negative breast cancer. She further investigated Euphorbia tirucalli for its anticancer activity and selectivity. She developed superparamagnetic iron oxide nanoparticles (SPIONs) infused with the plant's bioactive compounds through an eco-friendly synthesis approach. She further introduced an innovative acupuncture-assisted nanoparticle delivery system (SPIONs-EA), which has demonstrated remarkable success in enhancing tumour targeting and reduction, outperforming conventional chemotherapy in preclinical models, while significantly reducing side effects.

Her doctoral research has made significant strides in breast cancer treatment through an innovative approach that integrates nanotechnology, traditional medicine, and targeted drug delivery. Her research not only highlights the power of interdisciplinary science but also reveals the untapped potential of medicinal plants in contemporary medicine. Her work has made significant contributions to the applications of nanomedicine in oncology.

Doctor of Health Sciences in Biomedical Technology



Dr. Ntagi Gerald Mariri, MHSc (CUT)

Promoter: Prof. TJ Makhafola, PhD (UP)

Title: "Inhibitory effects of South African plants against mycotoxigenic phytopathogens"

Dr Ntagi Gerald Mariri's research investigated the inhibitory effects of South African plants against mycotoxigenic phytopathogens to develop a novel plant-derived bio-fungicide. He scientifically tested the in vitro efficacy and safety of medicinal plants earmarked for producing an eco-friendly biofungicide.

His research contributed to achieving the first two United Nations Sustainable Development Goals by enhancing food security and safety in vulnerable regions. The research findings promise advancements in agricultural innovation and public health, while documenting and preserving indigenous knowledge of medicinal plants for future generations. His study resulted in two articles published in high-impact international journals, presentations at local and international conferences, and co-authorship of a third article during his doctoral studies.

Doctor of Health Sciences in Biomedical Technology



Dr. Izêl Van Heerden, MTech (CUT)

Promoter: Prof. A Fossey, DSc (UP)

Co-promoter: Dr | G van der Walt, DTech (CUT)

Title: "Techno-economic assessment of process chains for the manufacturing of external maxillofacial prostheses for the South African ethnic demography using digital and Additive Manufacturing technologies"

Maxillofacial trauma can significantly impact a person's life. In South Africa, the impact of facial trauma is extensive, not only for individuals but also for their families. Many patients lack the funding to access advanced technologies for the manufacturing of external maxillofacial prostheses.

Dr Izél van Heerden's doctoral study focused on identifying costeffective alternative process chains for designing and manufacturing facial prostheses tailored to the South African ethnic demographic.

In her research, process chains incorporating medical image processing (MIP) and computer-aided design (CAD) software utelising computed tomography (CT) volumetric and structured-light surface scan data were evaluated against industry benchmarks. She identified four cost-effective process chains that deliver results comparable to the benchmarks, thereby improving patient access to life-changing technologies. Her findings were published in two international conference proceedings.

Doctor of Philosophy in Environmental Health



Dr. Silent Ruzvidzo, MHSc (CUT)

Promoter: Prof. SA Oke, PhD (UFS)

Co-promoter: Prof. NJ Malebo, PhD (UFS)

Title: "Evaluating the vulnerability and contamination of groundwater from mining dump in Welkom, Free State, South Africa"

Dr Silent Ruzvidzo's doctoral research focused on assessing the contamination and vulnerability of groundwater from mining dumps in Welkom. The study led to the development of a novel groundwater vulnerability assessment method, known as the DWAPH method, which is currently being patented.

His findings revealed that the groundwater at the CUT Welkom Campus has moderate vulnerability, with contaminants detected in the on-site boreholes. His research made significant contributions to the field, resulting in three publications in Department of Higher Education and Training (DHET)-accredited journals, including a book chapter, conference proceedings, and peer-reviewed journal articles.

Engineering industry expert and Denel Group Executive Landward, William Hlakoane joins a pool of graduates as he receives an

Honorary Doctorate



Prof. Deon De Beer, SARChi Chair Medical Product Development: Centre for Rapid Prototyping and Manufacturing (CRPM) and Dr William Hlakoane, Denel Group Executive Landward, CUT alumnus and the newly awarded Honorary Doctor.

The Faculty of Engineering, Built Environment and Information Technology (FEBIT) conferred the Honorary Doctorate in Mechanical Engineering (honoris causa) to William Hlakoane, a Mechanical Engineer by trade and the current Denel Group Executive Landward.

According to Hlakoane, his career in Engineering started in his early childhood when he and his peers used wires to build cars. He mentioned that he has always been an inquisitive child who has always loved fiddling and figuring things out. "As a child, I enjoyed assembling and disassembling things, and I also loved making wire cars. I think I would have been the first person to invent a car made of aluminium or zinc plates. I was a very curious young boy, so it was no surprise that I ended up in the engineering field," he said.

Dr Hlakoane said the honorary announcement brought him honour, pride and emotional joy. "I was in tears. It made me think back to where it all started, reflecting on the relationship I have with the institution, from the good old days to now, and everything I have achieved throughout my career. Out of a million things that I ever wanted in my life, this honour and recognition are the ones that my family and I will cherish forever," said Hlakoane joyfully.

Asked about his leadership and how he managed to wear multiple caps in his role, Hlakoane said he has always taken the approach of empowering himself with all the available knowledge, insisting on not only focusing on one specific job role. "I always wanted to be knowledgeable, but what has been outstanding for me in my career is the ability to work in different environments and apply my engineering knowledge in various aspects of businesses. People always ask me why I know so much, and my answer is simple... curiosity."

He added that his ability to wear many caps in different environments has allowed him to be where he is today. "Even outside of my career, I always say, the lessons learnt from school only give you a certain level of thinking or knowledge. However it is how you utilise it to gain more knowledge beyond those lessons. Use the same knowledge that you have gained to go beyond what you have acquired here."

When accepting his Honorary Doctorate, Hlakoane stated that he is proud of the university for what it has become. "I am a very proud alumni of this institution, and I wish all of you the success that you deserve."



CUT conferred an Honorary Doctorate in Mechanical Engineering (honoris causa) to industry leader, Dr William Hlakoane. Pictured: Vice-Chancellor and Principal, Prof. Pamela Dube, congratulating the newly capped Doctor, CUT alumnus and Denel Group Chief Operating Officer. On stage with them is Dr Sally Dzingwa, Institutional Register (far left) and Prof. Wendy Setlalentoa, Acting Deputy Vice-Chancellor: Research, Innovation and Engagement (far right).

Celebrating Academic Excellence: CUT Hosts Four Professorial Inaugurations in May 2025

The Central University of Technology, Free State (CUT), proudly hosted a series of four professorial inaugurations held in May 2025. These ceremonies are an important tradition in the academic calendar, as they honour scholars who have achieved the highest academic rank of full professorship. More than just symbolic milestones, professorial inaugurations celebrate individual achievement, inspire scholarly excellence, and showcase the university's expanding influence in research, teaching, and community engagement.

The series began on 08 May with the inauguration of **Prof. Gawie Schlebusch** at the Welkom Campus, marking the second such event to be held at the campus, which highlights its growing role in the university's academic landscape. On 15 May, **Prof. Pule Alexis Phindane** was honoured for his contributions to African languages, identity, and the decolonisation of education. **Prof. Moosa Sedibe** was inaugurated on 22 May for his impactful work in sustainable agriculture and food security. The final lecture in the series was delivered by **Prof. Petrus Jacobus Fourie** on 27 May, capping off a month of celebrating excellence, innovation, and the pursuit of knowledge.

Prof. Gawie Schlebusch delivered his Inaugural Lecture titled "Limited Proficiency in South African Schools: Past, Present, and Future



A moment of appreciation: Prof. Gawie Schlebusch received a token of appreciation from his Faculty of Humanities and CUT Executive Management following his insightful inaugural lecture. From left Dr Luzaan Schlebusch (wife), Prof. Pamela Dube, Vice-Chancellor and Principal, Prof. Gawie Schlebusch, Senior Lecturer-Welkom Campus, Prof. Wendy Setlalentoa, acting Deputy Vice-Chancellor: Research Innovation and Engagement and Prof. David Ngidi, Deputy Vice-Chancellor, Teaching and Learning.

In his lecture titled "Limited Proficiency in South African Schools: Past, Present, and Future", Prof. Schlebusch focused on the ongoing challenges faced by learners with Limited English Proficiency (LEP). He provided an in-depth exploration of how language barriers affect learners' academic progress and social integration, particularly when English is not their home language.

The lecture encouraged additive bilingualism, which supports the development of English while preserving learners' home languages. He presented strategies such as scaffolded instruction, explicit vocabulary teaching, and responsible code-switching as ways to support and empower multilingual learners in the classroom.

Reclaiming Voices: Prof. Phindane delivered an Inaugural Lecture on the Status of African Languages in Post-Apartheid South Africa



Professor Pule Alexis Phindane (centre)is congratulated by Prof. David Ngidi, DVC: Teaching and Learning (left) and Prof. Wendy Setlalentoa, acting DVC: Research, Innovation and Engagement (right).

In his thought-provoking lecture, Professor Phindane critically assessed the status of African languages in South Africa's education system three decades after the advent of democracy. The lecture, grounded in a qualitative research approach, examined the philosophical and policy dimensions of language use in higher education, uncovering a persistent dominance of colonial language ideologies.

Titled "Language, Power, and Decolonisation: Reimagining African Languages in Democratic South Africa", the lecture explored how linguistic imperialism continues to shape the educational landscape. Drawing on the conceptual frameworks of Linguistic Imperialism and Policy Analysis, he argued that despite the democratic dispensation and the promulgation of progressive language policies, such as the 2002 Language Policy for Higher Education, English remains the de facto language of instruction, research, and institutional communication.



CUT Hosts Four Professorial Inaugurations

Prof. Sedibe delivered his inaugural lecture on Synergies Between Agronomy and Global Research

Senate honours Prof. Fourie on his momentous achievement



Left: Prof. Laetus Lategan, acting Deputy Vice-Chancellor: Research, Innovation and Engagement, Prof. David Ngidi, Deputy Vice-Chancellor: Teaching and Learning, Prof. Moosa Sedibe and Prof. Pamela Dube, Vice-Chancellor and Principal.



From left: Prof. Wendy Setlalentoa, acting Deputy Vice-Chancellor: Research, Innovation and Engagement, Professor Petrus (Pieter) Jacobus Fourie and Prof. Pamela Dube, Vice-Chancellor and Principal.

Delivering his inaugural address titled "Synergies Between Agronomy and Global Research: A Pathway to Sustainable Food Systems," Prof. Sedibe shared insights from over a decade of impactful research and cross-border partnerships in the agronomy sector. His address highlighted how these collaborative efforts have reshaped agricultural practices to be more sustainable, resilient, and inclusive, instilling hope for a better future.

In his lecture titled 'Functional efficiency in livestock', a principle that calls for a deliberate alignment of form with function, Prof. Fourie explored the essential characteristics of livestock. These characteristics, such as adaptability, resilience, reproductive efficiency, and disease resistance, are crucial factors for survival in an increasingly resource-scarce and socio-economically uncertain world, making his research highly relevant. His research focused on the challenges faced by the extensive sheep, cattle, and goat industries.

Honouring a Legend: The Role of Language in Promoting Cultural Identity through Dr Khotso Nkhatho's Legacy



From left Prof. Alfred Modise, Dr Khotso Nkhatho, Mr Makhabane Koali, Dr Luzaan Schlebusch.

The Central University of Technology (CUT) honoured one of the Free State's cultural icons, Dr Khotso Nkhatho, under the theme "The Role of Language in Promoting Cultural Identity." Dr. Nkhatho, a strong advocate for preserving Indigenous languages, particularly Sesotho, played a significant role in this field. The public lecture, held in his honour, was more than a tribute; it became a deep reflection on the importance of Indigenous languages in preserving identity and heritage.

Delivering the keynote address at the 4th Annual Dr Khotso Nkhatho's Public Lecture was Mr Makhabane Koali, a respected community leader and educationist, who shared powerful insights into the current and future state of Indigenous languages. He emphasised that language goes beyond words, and it is a mirror of our surroundings, values, and lived experiences. "Language is everything around us," said Koali. "From the environment we live in to how we connect with others, our culture, our history, our food, it's all carried in language. If we lose that, we lose our identity."

He urged the audience to consider how countries like South Korea have become global cultural forces by promoting their mother tongue across all sectors. "Even with multiple dialects, they remain unified by language, and that's where their strength lies. Their language carries their identity, and the world respects that," he said.

He emphasised the power of media in shaping and sustaining language. "Media should be a tool we use to keep our languages alive through radio, television, storytelling, and music. Let's not only consume culture; let's preserve and promote it."

Mr Makhabane Koali has committed his life to teaching and nurturing young minds. As a former radio tutor, his commitment to holistic development extends beyond the classroom. He has achieved this commitment through many efforts to share valuable knowledge with a wide-ranging audience. He is the current Chief of Ha Kopano, where he upholds traditional values while promoting development within his community. Through his multifaceted roles, he continues to inspire many with his commitment to education, faith, and community upliftment.

CUT's celebration of Dr Nkhatho was a tribute to an individual and a call to action. As language policies undergo revision, his journey stands as proof that cultural identity can thrive when rooted in the richness of Indigenous expression, which encompasses traditional practices, storytelling, language, and art. His legacy continues to inspire generations of storytellers, educators, and language activists to remain true to their roots.

Dr. Khotso Nkhatho is a strong advocate for Sesotho language and its storytelling traditions. He is a respected educator, actor, director, and Sesotho novelist known for his outstanding performances and many roles in the 1980s Sesotho drama Mopheme. His unrelenting devotion to preserving Sesotho through the arts and media earned him an Honorary Doctor of Communication and Language Practice from CUT.

CUT faculty hosts the inaugural Research Centre on Human Technology interaction workshop to reimagine knowledge in a technological age



Prof. Premesh Lalu, a distinguished academic in human-technology studies, delivered a thought-provoking keynote that called on universities to rethink their role in today's world.

The Faculty of Engineering, Built Environment, and Information Technology (FEBIT) under the tutelage of Prof. Wendy Setlalentoa, acting Deputy Vice-Chancellor Research Innovation and Engagement, recently kicked off its first workshop for the Research Centre on Human-Technology Interaction (CHTI). The event was not just about driving technological innovation; it also aimed to create a space for a meaningful dialogue among academics and students about the future together. It explored the opportunities and challenges of rapid technological advancements while highlighting the critical need for ethical solutions.

Prof. Wendy Setlalentoa, acting Deputy Vice-Chancellor Research Innovation and Engagement, spoke about the vision behind the centre, which is to build a collaborative hub where ideas from engineering, ethics, business, the arts, and the social sciences could converge to tackle society's most pressing questions.

"Our goal is to create a space where experts from diverse fields can come together to address the most pressing challenges of our time. As technology continues to evolve, so must our understanding of its impact on individuals, communities, and the environment," she said

Prof Premesh Lalu, a distinguished academic in human-technology studies, delivered a thought-provoking keynote that called on universities to rethink their role in today's world. He emphasised that technology is no longer optional but an integral part of our everyday lives. "We all use technology, but our experiences and relationships with it vary greatly, and we also recognise how it affects our lives, work, and futures."

He called on universities to become centres of knowledge and ethical leadership in this new era. "Humans have co-evolved with technology for centuries. We will not be a species without technology. What happens when you don't think about where the people using that technology are being taken? Universities must be the place where we ask those difficult questions."

Prof. Lalu called for a study to understand the impact of technology from an African perspective and rethink how we relate to it ethically, politically, and socially. He noted that the establishment of the CHTI comes at a time when the world is grappling with profound technological shifts, such as the rise of AI, increasing automation, and the growing digital divide.

"This centre could not have come at a better time. Universities like CUT may be needed to guide the world in reimagining how humans and technology interact responsibly, equitably, and globally," he concluded.

CUT launches game-changing Student Support App assisting financially strained students



The Central University of Technology, Free State (CUT) officially launched a groundbreaking mobile app designed to identify financially at-risk students through a simple fingertip alert system. The app's user-friendly design instantly connects students to the Wellness Centre for timely support, making it an innovative tool that is easy and comfortable to use.

"Today, we have a lifeline, a bridge between those who are quietly struggling and the people and resources ready to support them. Often, the greatest challenge students face is not only academic but also financial. Financial challenges that too often go unnoticed until it is too late," said Prof Wendy Setlalentoa, Acting Deputy Vice-Chancellor: Research, Innovation and Engagement.

Prof. Parks Makhoahle, Senior Lecturer from the Faculty of Health and Environmental Sciences, highlighted that the higher education sector in South Africa faces persistent challenges related to student financial stress, often resulting in disruptive demonstrations, particularly at the start of academic terms and before major examinations.

"This App was developed in collaboration with the university's IT Department and can provide students with emergency contact options and connect them with wellness resources. It also allows them to monitor their financial risk levels, promote self-awareness, and directly connect them to our support services. This can be a real lifesaver for students facing financial stress," said Prof Makhoahle.

"It will support our students, especially those facing financial challenges. We encourage all students to use it when it becomes available and to reach out for help whenever needed. The App benefits students by providing real-time support whenever they experience financial challenges," concluded Prof. Makhoahle.

Two students who have explored the app prototype had high praise for its potential. When sharing their experience on the game-changing tool, this is what they had to say, "the App has a personalised tool and course support to help students manage their finances better. Many students are suffering in silence and are reluctant to seek help. This App will act as a middleman to assist them with accommodation challenges, funding, and course-related matters. What I like most about this App is that it gives you immediate feedback, and if you fall under high risk, you can consult the student support centre for help."

Community Engagement and Partnerships

Engineering and product design innovation takes centre stage at Industry Indaba



Some of the team members from CUT PDTS and MECAD, from left: Mzwake Moqhaisa, Thato Moloi, Angelique Johnson, Kekeletso Koroloso, Hayley Abrahams, Tyrone Boshoff, Francois Kuys (back), Miralde Kotze and Shelly Mona.

The Product Development Technology Station (PDTS), MECAD and DELL brought together industry experts and the next generation of designers and engineers at the Industry Indaba 2025 held at CUT. The Industry Indaba offered the opportunity to form connections, explore collaborations, and discover new opportunities in manufacturing and engineering while shaping the industry's future.

Acting Deputy Vice-Chancellor: Research Innovation and Engagement, Prof. Wendy Setlalentoa said that the indaba was more than just a networking platform. "It is a convergence of minds, a meeting of innovation and a reflection of our shared commitment to driving forward South Africa's technological and industrial growth. It is through such partnerships that we can collectively begin to respond to the national development priorities and global challenges. Through this partnership, our students, interns and clients gain access to industry-grade SolidWorks software, training and technical support. This will help us to foster a digitally capable workforce ready for the market demands. At the core of the CUT-PDTS, lies a deep sense of purpose, which is impact. Whether we are developing sensory integration equipment for therapy, improving hospital communication systems with local solutions or helping township-based entrepreneurs prototype their best product, our goal is very clear, to create meaningful change through innovation," said Prof. Setlalentoa.

Ms Shelly Mona, Deputy Director: Product Development Technology Station (PDTS), said, "as CUT-PDTS, we are proud to contribute to local economic development by localising production, reducing dependency on imports and enabling our communities to become creators, not just consumers of technology. We also remain committed to inclusive innovation, ensuring that our services reach those who are traditionally excluded from the innovation ecosystem. Our support of youth development through internships, mentoring, and practical experience is a testimony to our belief in people as the greatest source of innovation," said Ms Mona.

Community Engagement and Partnerships

CUT and SMRT.bio launch the Talent Implementation Model Entrepreneurs (TIME) Project



Mr Frank Melis, Chairman of SMRT.bio; Mr Bart Takkenkamp, CEO of SMRT.bio; CUT Vice-Chancellor and Principal, Prof. Pamela Dube and CUT Acting Deputy Vice-Chancellor: Research, Innovation and Engagement, Prof. Wendy Setlalentoa at the signing ceremony.

The Central University of Technology, in partnership with SMRT.bio, has launched the Talent Implementation Model Entrepreneurs (TIME) Project, a one-year initiative to enhance skills development, job creation, and entrepreneurship in the Mangaung region. The project uses an Al-powered platform to drive socio-economic impact through efficient implementation.

Prof. Pamela Dube, Vice-Chancellor and Principal, highlighted the partnership as a key milestone. The project leverages Al expertise in skills development and job matching, and Prof. Dube expressed excitement about the opportunities this collaboration presents for students and the future of education and technology.

"The TIME Project aims to transform lives at CUT and beyond, fostering entrepreneurship and contributing to regional economic growth. Students and alumni will benefit from structured mentorship with industry experts and access to international networks," she added.

The project offers aspiring entrepreneurs with a pathway to developing business models, receiving mentorship, and accessing funding opportunities.

According to Mr Bart Takkenkamp, CEO of SMRT.bio, this is the first of its kind in South Africa. "We are expanding across Europe, and I am pleased to inform you that the European Commission is also looking after us. This cooperative approach that we discovered throughout the years guarantees that together we will have a successful project."

Mr Frank Melis, Chairman of SMRT.bio emphasised the importance of inclusivity, inviting not only students but also the wider community to participate in this initiative, which aims to spark economic change nationwide. The success of the Talent Implementation Model Entrepreneurs (TIME) Project depends on active collaboration between multiple stakeholders at CUT and within the broader community.

Community Engagement and Partnerships

CUT Samsung Innovation Campus host Graduation Ceremony for 3rd Cohort



Dignitaries from CUT and Samsung with the SIC graduates.

The Central University of Technology, (CUT) in partnership with Samsung hosted a graduation ceremony where certificates were awarded to 21 students from the third cohort who had completed studies in Al in the prestigious Samsung Innovation Campus (SIC) programme.

One of the most impressive outcomes of this SIC relationship with CUT is that 16 of the 21 students have already secured work. For the time being, five (5) of these graduating students have decided to continue their education rather than seek employment.

The SIC programme has trained young participants in 4IR skills including Al, IoT, Big Data, and Coding and Programming. The programme comprises theoretical learning, practical sessions, and capstone projects, preparing students for the tech industry and permanent employment in the field. It aligns with South Africa's National Development Plan's goal to eliminate poverty and reduce inequality by 2030.

When delivering her address, Prof. Wendy Setlalentoa, acting Deputy Vice-Chancellor: Research, Innovation and Engagement said the event is a testament to the transformative power of collaboration. "This programme isn't just a training platform, it's a catalyst for growth and development, significantly reshaping the region's digital landscape. We are grateful to Samsung for choosing to partner with our institution and helping us make a lasting impact in the lives of our young people in South Africa. This partnership is a prime example of a well-functioning and mutually beneficial Public Private Partnership (PPP) with tangible examples of how to address youth unemployment and skills development. In the last four years, our institution has had the opportunity to play a crucial role in providing the curriculum and training for students in 4IR skills and focus on developing practical skills that have helped prepare them for future careers in the innovation and technology space," added Prof. Setlalentoa.

She commended the SIC initiative for its role in bridging the academia and industry gaps, and for raising CUT's profile as a hub of innovation. "Samsung didn't just show up with a logo and a laptop, they showed up with a vision, resources, expertise and a sincere belief in the potential of our students. Your presence is helping us rewrite the narrative of what is possible in places like Bloemfontein, Welkom, Botshabelo, and beyond. As the next wave of tech talent emerges from the Free State, the success of the Samsung Innovation Campus reminds us that the future doesn't arrive, it's built, line by line, student by student."

Lefa Makgato, Corporate Social Responsibility Manager: Samsung Electronics in Southern Africa said: "We are very proud of what this partnership has achieved in the last four years; and how well its accomplishments align with the country's Vision 2030 goals. Importantly, this collaboration with CUT has also ensured that these students are now equipped with the skills to contribute to the digital economy. But most importantly, in conjunction with CUT, we have now been able to accomplish Samsung's education vision, which centres around fostering future technological leaders and ICT entrepreneurs by providing accessible and engaging learning experiences that integrate technology and real-world applications."



Top performers at the Samsung Innovation Campus certificate handover ceremony, from left: Bowman Wessels (3rd), Botle Nqobo (2nd) and Mpho Ramaisa (1st).

CUT Medical Microbiology students globally recognised for their investigation on the role of Al in science education and Higher Education



At one of the CUT's state-of-the-art laboratories, young innovators and scientists in the making- Ms. Nthabiseng Tshandu (left) and Chanelle McLeod (right) are proving to the world that Al plays a critical role in science education and the Higher Education Sector. They are seen here with Lecturer, Prof. Parks Makhoahle.

CUT Ms. Chanelle McLeod and Ms. Nthabiseng Tshandu, second and third year Medical Microbiology students, achieved a significant milestone and recognition when they presented their paper titled "Artificial Intelligence (AI) Through the Student Lens: A Q&A with Central University of Technology Students" at a global stage.

Both students were invited to present at a prestigious global event attended by approximately 803 scientists hosted by the University of Kent, England. Their presentation, titled "Al Through the Student Lens: A Question & Answer Al Engagement with Central University of Technology Students," was delivered alongside renowned academics and students from various international institutions.

As part of a diagnostic practical, second and third year Medical Microbiology students integrated Al tools such as ChatCPT 3.5 and Meta Al (WhatsApp) into their investigation to identify pathogenic organisms. They populated large language models (LLMs) with patient MCS (microscopy, culture, and sensitivity) data, supplemented with biochemical test results, and critically evaluated Al-generated feedback.

Under the mentorship of Prof. Parks Makhoahle, Lecturer for Medical Microbiology (MMCB216) (2nd-year) and MMCB317 (3rd-year) Medical Microbiology practical, students engaged in a diagnostic practical integrating Al tools to analyse pathogenic organisms. Using microscopy, culture, and sensitivity (MCS) data, supplemented with biochemical test results, students critically evaluated Al-generated diagnoses. Their assignment focused on identifying bacterial pathogens that exhibited beta-haemolytic and weak alpha characteristics on blood agar, with specific Gram morphological structures observed as long chains and diplococci/short chains respectively for different academic levels.

Prof. Makhoahle added, "our students showcased the integration of Al into Medical Microbiology diagnosis, emphasising its benefits while cautioning the attendees about the importance of information verification and human oversight in their final clinical decisions. Their contribution highlighted CUT's commitment to innovation in medical education and the critical role of Al in diagnostic sciences."



Third-year Medical Microbiology student Ms. Nthabiseng Tshandu with Prof. Parks Makhoahle, her MMCB317 Lecturer.

Their synopsis were accepted for presentation alongside subject experts and students from other universities around the world.

When elaborating on her synopsis, Nthabiseng said her experience with Al has been beneficial in her academics as there were concepts that she could not grasp from physical learning and teaching, that she now masters because of the App. "Incorporating Al in learning and teaching has the potential to enhance student engagement, clearer understanding and better outcomes as much as it has its challenges," she highlighted.

"The positive part is that AI can help reduce the workload of instructors by automating the grading process for multiple choice questions and other objective assessments, it can enable students to explore complex concepts in an engaging way, it can tailor learning experiences to individual's needs and learning styles. It also provides one-on-one support to students, offering real-time feedback and guidance, and can create effective study timetables as well as provide tips on how to learn complex concepts. On the downside, AI can create an over-reliance, which can lead to a lack of human interaction and empathy in the learning process. It is not always accurate and reliable, and its biased data can lead to flawed decision making," she said.

She added that using the App for her assignment opened up ample learning opportunities as it provided her with more information by suggesting further testing in molecular or biochemical tests to confirm the identity of the organism, which had made a tentative identification

"If I had not used AI, I would not have known some concepts of Staphylococcus aureus which are similar to Enterococcus faecalis. It helped me differentiate between factors and the same factors. Furthermore, it has enhanced my confidence because I had to go to other sources to compare my results with what I performed, and I got to learn even more," she concluded.



Second year Medical Microbiology student Chanelle McLeod with Prof. Parks Makhoahle, her MMCB216 Lecturer.

Chanelle McLeod said that Al plays a critical role in enhancing learning and interpretation. It is also a transformative tool that enhances academic performance, fosters curiosity, and empowers students to approach scientific inquiry with confidence. "Artificial Intelligence (Al) has revolutionised academics by providing tools for research, analysis, and interpretation. It has assisted me with my research, the data analysis, interpretation of the microorganism and the antibiotic zone sizes I observed in my practical class. It also provided insights that improved my comprehension on this particular microorganism by providing a clear explanation of my results and findings."

She further added that Al confirmed her findings with more illustrations that deepened her understanding, elaborating on her explanation and interpretations. "It enhanced my ability to analyse microbial data by providing clear explanations for each piece of information. It also played a crucial role in simplifying microbiological processes. The App also clarified laboratory techniques such as Gram staining, bacterial smear preparation, and heat fixation. Additionally, it provided insights into biochemical tests, antibiotic susceptibility testing, and antibiotic interpretation, enabling me to assess antibiotic effectiveness against bacteria."

Chanell said that through this experience, she has concluded that if used responsibly, Al is a supportive tool rather than a replacement for human analysis. "If I had submitted my assignment without Al, my knowledge would have been limited. It has boosted my confidence in this course and that gives me peace of mind knowing that my results are precise. It also improved my ability to interpret my laboratory results accurately, articulating my findings clearly.

"Reflecting on the role of Al in education, I believe its integration will enhance both learning and teaching as it provides access to vast academic resources, validates findings, and broadens perspectives on scientific concepts. It also fosters independent learning with personalised feedback, making complex topics more accessible," she concluded.

CUT Engineering students speed ahead to victory and crowned the 2025 Overall Eco-Vehicle Project 2.0-Bluetooth Race champions



CUT's 2nd and 3rd-year Electrical and Mechanical Engineering students crowned the 2025 Eco-Vehicle Project 2.0-Bluetooth Race champions.

The Central University of Technology students in their second and third-year Electrical and Mechanical Engineering have once again demonstrated their engineering prowess by securing a remarkable win at the recent Eco-Vehicle Project 2.0-Bluetooth Race event, hosted by the University of the Free State (UFS). Competing against several other institutions across the region, the CUT team claimed victory in the highly anticipated Bluetooth-Controlled Race. A key feature of this innovative event was its focus on sustainable transport and technology-driven solutions.

The Eco-Vehicle Project is a prestigious platform that challenges students from various institutions to design, build, and race environmentally friendly vehicles, integrating principles of engineering, creativity, and sustainability. The programme consists of cycles where the team acquire skills to be more empowered and upskilled in preparation for the main race in September. With the guidance of their Engineering Mediator, the team performed exceptionally well, winning the Drag Race and completing the Circuit Race in 1 minute 49 seconds.

The team will also participate in the main event of the Eco-Vehicle Project 2.0, scheduled to take place on 27 September 2025, where they will once again showcase their passion for sustainable engineering and cutting-edge design and compete against other institutions such as UNISA, NMU and UFS (Bloemfontein, Qwaqwa and South Campus).



In action: the CUT team claimed victory in the highly anticipated Bluetooth-Controlled Race.

"Winning this Bluetooth race was a proud moment for all team members. It was not just about speed, but also precision, collaboration, innovation and problem-solving under pressure. Furthermore, this victory is more than just a trophy; it is a celebration of how far young engineers can go when creativity meets practical skills. It is also a testament to CUT's commitment to nurturing the next generation of problem-solvers who are ready to take on global challenges with locally grown solutions. We are excited to keep that momentum going as we prepare for the main event in September," said Revelation Jr Mokgakala, Engineering Mediator and Team Leader, CUT Eco-Vehicle 2.0 team.

He added that the team is also open to sponsors. "We are robustly trying to raise funds and would appreciate any kind of support from sponsors to meet our required needs. Thank you in advance to all people who are willing to sponsor us to carry on with this innovative course."

Esteemed Academic Joins McGraw Hill Medical Education Advisory Board: A Strategic Win for CUT



The Central University of Technology, Free State (CUT) is proud to announce that Professor Samson Mashele, Dean of Health and Environmental Sciences, was invited to join the McGraw Hill Medical Education Advisory Board.

This prestigious appointment marks a major recognition of Prof. Mashele's leadership in medical education and opens doors for CUT to influence the future of healthcare training in South Africa.

His participation is more than symbolic. It positions CUT at the table where national educational strategy is discussed on topics ranging from curriculum innovation to the integration of artificial intelligence in medical training. CUT's voice will now help steer decisions on digital platforms such as Access Medicine and influence how global resources are tailored for South African institutions.

For CUT, this is a strategic advantage, as it directly connects the university to international networks, enriching its academic visibility and allowing for early access to educational innovations. It also strengthens the university's credibility as a thought leader in medical and health sciences education. Students and staff will benefit through exposure to cutting-edge resources and practices.

As the healthcare landscape evolves, CUT continues to rise, driven by leadership that not only responds to change but helps define it.

Dr Choice Makhetha reappointed to the Council on Higher Education's Institutional Audits Committee



Congratulations to Dr Choice Makhetha, Executive Director in the Office of the Vice-Chancellor, on her reappointment to the Council on Higher Education's Institutional Audits Committee (IAC). Dr Makhetha has served on the IAC since 25 February 2020, and her continued leadership reinforces our commitment to quality and accountability in higher education.

Her position is crucial in fostering effective good governance and ensuring quality assurance in higher education, primarily through the institutional audit process. CUT is committed to ongoing dialogue and collaborations within the sector, as demonstrated by the recent visit of the CHE, reinforcing the significance of these audits and collaborations.

Prof. Ntsoaki Malebo appointed as new Dean of Health and Environmental Sciences



Congratulations to Prof. Ntsoaki Joyce Malebo on her appointment as Dean: Faculty of Health and Environmental Sciences, effective 1 September 2025.

Professor Malebo is a seasoned academic, leader and scientist with 15 years of experience in higher education. Her academic journey at the Central University of Technology began in 2010 as a postdoctoral fellow and researcher, gaining international exposure through her selection for the 5th HOPE Meeting with Nobel Laureates, hosted by the Japan Society for the Promotion of Science. This opportunity set the tone for a career of innovation and global collaboration.

Her contributions to academic development extend to national and international programme reviews. Her career exemplifies dedication to academic excellence, groundbreaking research, and transformative education. She has coordinated the Academic Developer Special Interest Group within HELTASA and spearheaded CUT's iKudu project, which champions the Internationalisation of the Curriculum (IoC) and Collaborative Online International Learning (COIL).

Her leadership was shaped and amplified by her training in programmes such as the CUT Next Generation Women in Leadership Programme, the HELM women in Leadership Programme, the HELM Foundations of Leadership Programme, and the HERS-SA Academy for leadership.

As a registered Professional Natural Scientist with SACNASP, Prof. Malebo has published extensively, and presented at prestigious conferences. Her scholarly work has been widely published in accredited academic journals, and she has presented her research papers at both national and international conferences. In her professional career, she has supervised and co-supervised numerous master's and doctoral degree students and has inspired countless students through her teaching and leadership.

With a PhD in Microbiology from the University of the Free State and additional qualifications in higher education and leadership from Rhodes and Stellenbosch universities, she has become an inspiration in academia and beyond.

CUT Professor appointed as a member of the Provincial Health Research Committee of the Free State Department of Health

Dr Xolani Khohliso appointed as a Board Member of the Pan South African Language Board (PanSALB)



Prof. Pakiso 'Parks' Moses Makhoahle has been appointed as a member of the Provincial Health Research Committee of the Free State Department of Health (PHRC-FS) for the term 2025-2028.

Makhoahle is currently a Senior Lecturer, Biomedical Technology, in the Department of Health Sciences, Faculty of Health and Environmental Sciences. He is a recognised Golden Key International Honour Society member, celebrated for his academic excellence and leadership in biomedical research.

His new role involves overseeing the implementation and quality of health research conducted in the province. He will also ensure that health research agendas and resources are aligned with priority health issues, advise the MEC on applying and implementing an integrated national strategy for health research, and coordinate research activities among public health authorities. As a scientist and academic, his role will extend beyond governance; involving the translation of rigorous academic research into actionable strategies that improve public health outcomes.



The Central University of Technology congratulates Dr Xolani Khohliso on his appointment by the Minister of Sport, Arts, and Culture as a Board Member of the Pan South African Language Board (PanSALB) for five years.

Dr Khohliso, Director: Curriculum and Academic Staff Development and Head of the Scholarship of Teaching and Learning, is also the institutional coordinator for the Language Policy Development Project, a three-year initiative commissioned by the Department of Higher Education and Training (DHET).

His appointment demonstrates his dedication and leadership in the field of language development and education as well as his research interests and advocacy for integrating African languages into academic research, teaching, and learning. It also highlights CUT's commitment to promoting and developing African languages, a cornerstone of the university's mission to foster inclusivity and cultural diversity in higher education.

Minister of Public Works and Infrastructure has appointed Shelly Mona as a Council Member of the Engineering Council of South Africa



Ms Shelly Mona, Deputy Director: Product Development Technology Station (PDTS), has been appointed by the Honourable Minister, Dean Macpherson, to serve in the Engineering Council of South Africa (ECSA).

Her appointment recognises her ongoing contribution to the engineering profession and her commitment to advancing the built environment. Her duties to oversee professional standards, transformation, education, and registration commenced on 23 April 2025 and will conclude on 22 April 2029.

Ms Mona is a distinguished professional with a remarkable track record of success in various capacities. She leads diverse teams in product development and manufacturing at CUT.

Mona is a registered Professional Engineering Technologist with the Engineering Council of South Africa. She holds a BTech in Mechanical Engineering from the University of Johannesburg. She has further specialised in Industrial Engineering and Management, earning a Master of Engineering (MEng) from Tshwane University of Technology. Complementing her academic credentials, she holds certificates in Project Management and Production and Operations Management from the University of Johannesburg and the University of South Africa.

Ms Mona has served as an academic Programme Accreditation Assessor for the Engineering Council of South Africa, delivered industry lectures to engineering students, and hosted webinars. Her research, presented and published at national and international conferences, showcased her expertise and thought leadership, instilling confidence in her academic prowess.

Her ongoing academic pursuits demonstrate her dedication to engineering. In addition to her professional responsibilities, she is pursuing a PhD in Industrial Engineering at the University of Johannesburg. Her research focuses on the "Development of Frameworks for the Adoption of Additive Manufacturing Technology for the South African Automotive Industry".

Two CUT Academics received the DHET University Staff Doctoral Programme: Junior Research Fellowship







Dr. Nolwazi M.R. Qumbisa has been awarded the DHET University Staff Doctoral Programme: Junior Research Fellowship to develop a multi-level evaluation framework for evaluating the functionality, sustainability, and affordability of affordable housing enabled by Innovative Building Technologies (IBTs) in South Africa. The research aims to address housing shortages, rapid urbanisation, and the impact of climate change on vulnerable communities. The study will integrate stakeholder perspectives and employ a mixedmethods approach, incorporating a systematic literature review, expert panels, real-world case studies, and focus group discussions. The framework will serve as a practical tool for evaluating IBT-enabled housing solutions, promoting informed decision-making and societal acceptance of these technologies.

CUT celebrates Africa Month: A Collective Expression of African Identity and Justice



Faculty of Management Sciences: Bloemfontein and Welkom Campuses Africa day Celebration: We wear our roots with pride, carry our history with strength, and rise with justice in our hearts! "I am not an African because I was born in Africa, I am and African because Africa was born in me" (Nelson Mandela).



CUT proudly celebrated Africa Month under the African Union's theme: Justice for Africans and People of African Descent Through Reparations." The Center for Global Engagement launched the "We Wear Africa" team challenge where faculties, departments and centres were invited to express their African pride through vibrant traditional attires and a meaningful caption or quote reflecting their identity and vision of justice.

This vibrant campaign was more than a celebration of fashion, it was a powerful reminder of our unity, shared heritage, and the role of academic institutions in shaping narratives of justice and inclusion. Through bold colours, thoughtful words, and collective participation, the different departments and faculties honoured what it means to be African on the continent, in the diaspora, and within a globally connected institution like CUT.



