



DURBAN UNIVERSITY OF TECHNOLOGY
INYUVESI YASETHEKWINI YEZOBUCHWEPHESHE

RESEARCH FOCUS AREAS

ENVISION2030

transparency • honesty • integrity • respect • accountability
fairness • professionalism • commitment • compassion • excellence

CREATIVE. DISTINCTIVE. IMPACTFUL.

The Durban University of Technology (DUT)

DUT is a research-intensive institution with campuses situated across Durban and Pietermaritzburg, South Africa.

Six faculties offer undergraduate and postgraduate qualifications:



FACULTY OF
ACCOUNTING
& INFORMATICS



FACULTY OF
APPLIED
SCIENCES



FACULTY OF
ARTS &
DESIGN



FACULTY OF
ENGINEERING
& THE BUILT
ENVIRONMENT



FACULTY OF
HEALTH
SCIENCES



FACULTY OF
MANAGEMENT
SCIENCES



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FOREWORD

PROFESSOR FULUFHELO NEMAVHOLA

Deputy Vice-Chancellor: Research, Innovation & Engagement (DVC: RIE)

Durban University of Technology is advancing its position as a leading research-driven university, aiming to connect researchers, industry, government, and communities to produce practical solutions that improve lives and livelihoods, while strengthening postgraduate training, research excellence, and innovation-led development. This marks a strategic step in strengthening DUT's capacity to deliver high-impact, solutions-driven research aligned to economic development, social progress, and sustainable innovation.

The Durban University of Technology's (DUT) research agenda has never been more ambitious or essential, judging by this pivotal moment in DUT's strategic investment in the future of knowledge, innovation and societal impact.

DUT strives to position its institution as a global leader in innovative research, marking a strategic step in strengthening DUT's capacity to deliver high-impact, solutions-driven research aligned to economic development, social progress, and sustainable innovation.

The historic launch of 18 research institutes at DUT reveals a more expansive research story: DUT now hosts 11 SARCHI Research Chairs awarded by the National Research Foundation (NRF), spanning sustainable protein innovation; water and wastewater technology; smart manufacturing; inclusive entrepreneurship; social justice in education; sustainable energy; biovalorisation; wastewater reuse; health promotion; infrastructure development; and digital transformation.

The 18 new institutes complement our two existing research institutes – one established and one emerging centre, and four emerging and 10 established research focus areas – contributing to a research profile constructed for profound impact rather than mere output.

The new institutes position DUT at the forefront of applied, solutions-driven research, guided by ENVISION2030 and a commitment to being Creative, Distinctive and Impactful. They create focused platforms where researchers, postgraduate students, industry and communities work together on national and global priorities, from hydrogen technology and artificial intelligence to smart agriculture, advanced manufacturing, biotechnology, ocean engineering, climate resilience and health innovation.

These institutes are performance-driven research engines designed to generate solutions, lock in partnerships and produce future-ready graduates grounded in DUT's Living Values of transparency, integrity, respect, accountability and excellence.

DUT is intensifying its role as an engaged university that transforms knowledge into real-world impact. This pivotal moment reflects DUT's commitment to its stewardship responsibility and determination to improve lives and livelihoods, locally and globally, through research that matters. I invite you to read on to realise the magnitude of what DUT is busy building.

11 SARCHI CHAIRS

The Durban University of Technology (DUT) has been awarded 11 South African Research Chairs Initiative (SARCHI) Chairs by the National Research Foundation (NRF), under the Department of Science, Technology and Innovation (DSTI) Decadal Plan Aligned Research Chairs for Historically Disadvantaged Universities, Universities of Technology and Emerging Universities.

The Decadal Plan Aligned Research Chairs (SARCHI Chairs) forms part of the 41 new Chairs that were officially launched by the Minister of Science, Technology and Innovation, Professor Blade Nzimande, at the NRF Building in Pretoria on 16 April 2026. The new cohort of 41 Research Chairs was unveiled to strengthen research capacity, advance innovation and support the development of critical skills across the country's public universities.

Existing SARCHI Chair:

Professor Faizal Bux

Chair in Water and Wastewater Technology



The 10 new Research Chairs at DUT consist of:

01	Professor Eric Oscar Amonsou Chair in Sustainable Protein Innovation	06	Professor Kugen Permaul Chair in Biovalorisation
02	Professor Rendani Wilson Maladzhi Chair in Smart Manufacturing Technologies	07	Professor Sheena Kumari Kuttan Pillai Chair in Wastewater Treatment and Reuse
03	Professor Pfano Mashau Chair in Future-fit and Inclusive Entrepreneurship for a Pan-African Society	08	Professor Julian Pillay Chair in Well-being, Equity, Learning and Leadership in Health Promotion (WELL)
04	Professor Tabitha Grace Mukeredzi Chair in Education, Social Justice and Society	09	Professor Molusiwa Stephan Ramabodu Chair in Sustainable Construction and Infrastructure Development
05	Professor Oludolapo Olanrewaju Chair in Sustainable Energy and Industrial Efficiency	10	Professor Olive Stumke Chair in Digital Transformation, Governance, SME Innovation, Education and Skills

Existing Chair: Water and Wastewater Technology

Professor Faizal Bux



Professor Faizal Bux is a leading South African researcher in water and wastewater treatment technology, with more than 30 years of experience in advancing sustainable water solutions for developing economies. As Director of the Institute for Water and Wastewater Technology at DUT and a DSI-NRF SARCHI Chairholder, he has evolved his scientific career from applied wastewater treatment research to internationally-recognised leadership in algal biotechnology, wastewater-based epidemiology and resource recovery. Prof Bux has contributed extensively to knowledge generation with over 320 peer-reviewed publications in leading WOS journals, numerous book chapters, edited books and international conference presentations, achieving global recognition through an NRF B2 rating and inclusion on Stanford University's list of the top 2% most-cited scientists. His work has been cited 24 200 times with an H-index of 76. Prof Bux is ranked third in South Africa in the field of Environmental Science and his work has led to impactful collaborations with national and international partners across BRICS and other global networks, strengthening research capacity and innovation in water sustainability. He has supervised and mentored several postgraduate students, postdoctoral fellows and emerging researchers, contributing significantly to capacity development in South Africa. He is an elected member of the Academy of Science of South Africa, Senior Fellow of the Water Institute of Southern Africa (WISA), Fellow of the Royal Society of Chemistry and Distinguished Fellow of the International Water Association (IWA). He holds substantial leadership roles both nationally and globally, including in IWA, WISA and BRICS. Prof Bux's contributions to the water sector have been recognised, and he is a recipient of various awards, including from the Water Research Commission, National Science and Technology Forum and NRF.

Chair in Sustainable Protein Innovation

Professor Eric Oscar Amonsou



The Chair in Sustainable Protein Innovation (CSPI) at DUT is a five-year, high-impact research programme dedicated to developing sustainable protein solutions for Africa and beyond. The programme focuses on three strategic protein sources: pulse grains, edible insects and filamentous fungal fermentation, each offering unique opportunities for nutrition security, environmental sustainability and industrial innovation. The Chair aims to produce commercially-viable next-generation protein isolates and ingredients suitable for applications in sports nutrition, beverages, meat analogues and healthy food formulations through advanced protein chemistry, bioprocessing, fermentation, functional characterisation and pilot-scale technology development, thus adapting to our transforming society. The programme integrates research excellence with capacity-building by training Master's, PhD and postdoctoral researchers in cutting-edge techniques, analytical skills and innovation practices. A strong emphasis on industry collaboration, technology transfer, and entrepreneurial development ensures that discoveries move beyond the laboratory into commercial applications. By leveraging interdisciplinary expertise, strategic partnerships and state-of-the-art facilities, the Chair will contribute significantly to food and nutrition security, sustainable production systems, rural development and the growth of Africa's alternative protein industry. Prof Amonsou is a Food Science Professor at DUT and a C2-rated NRF Research Scientist in South Africa. He holds a PhD in Food Science, an MPhil in Food Science, and a BSc (Hons) in Agricultural Engineering, and brings over 15 years of teaching and research experience in higher education. Prof Amonsou is the Founder and Director of INOFID, a DUT spin-off company built around a prototype with registered intellectual property aimed at scale-up and commercialisation.

Chair in Smart Manufacturing Technologies

Professor Rendani Wilson Maladzhi



This SARCHI Chair is dedicated to advancing the digital and sustainable transformation of manufacturing systems in South Africa and beyond. The Chair focuses on developing practical, scalable and industry-relevant solutions that enhance productivity, sustainability and competitiveness, particularly for small and medium enterprises (SMEs). Its research integrates Industry 4.0 and Industry 5.0 technologies, including digital transformation, data-driven manufacturing, artificial intelligence, smart automation, additive manufacturing, predictive maintenance and advanced manufacturing systems. The research programme is structured around five interconnected themes: digital transformation of manufacturing systems; data-driven manufacturing and decision intelligence; sustainable and circular manufacturing systems; smart automation, advanced manufacturing and retrofitting for SMEs; and additive manufacturing, technology adoption and innovation. The Chair contributes to sustainable industrial development, economic transformation, skills development and technological innovation through multidisciplinary collaboration, industry engagement and postgraduate capacity development. The Chair serves as a platform for research excellence, knowledge generation and the development of future manufacturing leaders capable of driving smart and sustainable industrial growth in emerging economies, aligned with South Africa's National Development Plan and industrialisation priorities.

Chair in Future-fit and Inclusive Entrepreneurship for a Pan-African Society

Professor Pfano Mashau



Professor Pfano Mashau is the Director of the DUT Business School and leads research and academic initiatives focused on entrepreneurship, innovation and sustainable economic development. His work examines how entrepreneurship can become a vehicle for inclusive growth, employment creation and societal transformation. He explores how African entrepreneurs can anticipate technological, economic, environmental and social changes through the Future-Fit and Inclusive Entrepreneurship research agenda. In the African context, his research places particular emphasis on digital transformation, artificial intelligence, entrepreneurial ecosystems, innovation and inclusive enterprise development. He advocates for entrepreneurship education that moves beyond preparing graduates to seek employment towards developing opportunity creators, innovators and problem-solvers. His approach is strongly grounded in African realities, recognising the value of indigenous knowledge, local communities and African entrepreneurial capabilities. The aim is to connect academic knowledge with practical solutions that address unemployment, inequality and sustainable development challenges. He has published extensively in entrepreneurship and related fields and has supervised doctoral and postgraduate research. His leadership at DUT Business School supports the development of future-ready programmes, partnerships and entrepreneurial initiatives aligned with DUT's Envision2030. His work seeks to strengthen Africa's entrepreneurial ecosystem through collaboration with industry, government, communities and international partners. After all, Future-Fit and Inclusive Entrepreneurship is about building entrepreneurs and enterprises that are innovative, resilient, responsible, inclusive, and capable of creating lasting value for African society.

Chair in Social Justice, Education and Society

Professor Tabitha Grace Mukeredzi



The SARCHI Chair focuses on advancing inclusive education in rural and historically underserved schools. The Chair is guided by principles of social justice, equity, diversity and inclusion, with the aim of generating contextually-relevant and theoretically-informed knowledge. Its work seeks to strengthen teachers' capacity to address diverse learner needs and contribute to improved educational policy, practice and institutional development. A key priority is collaboration and knowledge co-production through partnerships within DUT and with national and international scholars, research institutions and stakeholders. These partnerships promote interdisciplinary research, strengthen research networks and ensure that knowledge responds to local educational realities while contributing to broader debates on inclusive education. The Chair also prioritises multi-level capacity development for rural teachers, preservice teachers and university educators through research, postgraduate supervision, professional learning, communities of practice, and knowledge-sharing initiatives. Sustainability is strengthened through institutional capacity building, strategic partnerships, resource mobilisation and potential collaboration with organisations such as the ETDP SETA. Ultimately, the Chair seeks to transform education systems by promoting equitable, inclusive and socially just educational opportunities. The Chair aims to create education systems where diversity is recognised as a resource and all learners and teachers are empowered to participate, develop and succeed through research excellence, collaboration, capacity development and engagement with policy and practice.

Chair in Sustainable Energy and Industrial Efficiency

Professor Oludolapo Olanrewaju



The SARCHI Chair aims to develop, validate and pilot a deep multi-task learning and reinforcement learning (MTL-RL) framework that classifies community suitability, predicts demand and renewable output and recommends cost-reliable, low-carbon energy mixes for underserved communities in sub-Saharan Africa, with a South African pilot study. The objectives include (1) foundational data and sustainable classification; (2) demand and renewable output forecasting; (3) reinforcement learning for optimal energy mix; and (4) techno-economic, socio-economic and policy/standard integration. During the first cycle, the SARCHI Chair hopes to achieve its goals while contributing to the skills set in producing five Postdocs, five Doctoral, 10 Master's and a couple of Honours and Undergraduate qualifications. The task will be jointly managed by the SARCHI team, industrial collaborators as well as local and industrial partners.



Chair in Biovalorisation

Professor Kugen Permaul



The aim of the Chair on Biovalorisation is to advance research, innovation and application in the field of biomass valorisation for enzyme production and biocatalysis. Biocatalysis offers environmentally-friendly, efficient routes for various industrial processes. The primary research focus of the Chair will be to explore a range of enzymes such as carbohydrases, proteases and laccases and their diverse applications across various industries. A key strategy in utilising these enzymes in industrially-useful processes will be the use of waste biomass as a resource for the growth of microorganisms or the substrate for chemicals and biochemicals. While biotechnology processes are 'green technologies' by their very nature of using microorganisms or enzymes as biocatalysts, the additional use of waste biomass in production processes further enhances environmental friendliness. Another key strategy will be the implementation of circular bioeconomy processes during production of chemicals and biochemicals. Although circular economies have been contemplated for a few decades, their implementation has been accelerated in a wide range of industries. In a bioprocess, a circular approach makes absolute sense as waste resources are often used as starting materials. The research focus of the proposed Chair is aimed at the advancement of research, innovation and application in the fields of enzyme production, biocatalysis, biomass valorisation, biofuel production and probiotics, in conjunction with established and emerging researchers in DUT's Department of Biotechnology and Food Science. The Chair will fund innovative projects to be led by the above collaborators. A key deliverable of the research conducted in the first five-year cycle would be the establishment of a commercial process to valorise waste biomass using a circular economy bioprocess.

Chair in Wastewater Treatment and Reuse

Professor Sheena Kumari Kuttan Pillai



Professor Sheena Kumari's multidisciplinary research centres on biological wastewater treatment processes, combining microbial ecophysiology with advanced molecular tools to analyse microflora dynamics and enhance sustainable wastewater treatment technologies. Additionally, her research addresses critical emerging environmental threats, including micropollutants, bioaerosols and the dynamics of microplastics in aquatic systems. Beyond pollution mitigation, her SARCHI focus embraces the circular economy through wastewater beneficiation, reclaiming essential nutrients and promoting waste-to-energy pathways. Ultimately, her work informs public health risk assessments and directly supports global initiatives like the United Nations' Sustainable Development Goals (SDGs) to safeguard water security and expand safe water reuse.

Chair in Well-being, Equity, Learning and Leadership in Health Promotion (WELL)

Professor Julian Pillay



In South Africa, adults face a devastating burden of non-communicable diseases (NCDs), with less than half meeting physical activity guidelines and rising obesity rates. This begins early in life, compounded by deep-seated inequalities in our schooling systems – where children in lower-quintile schools lack access to safe physical activity, health education and supportive environments. The Chair, in responding to these urgent social challenges, directly aligns with the United Nations' SDGs, particularly SDG 3 (Good Health and Well-being) and SDG 10 (Reduced Inequalities) as well as DUT's ENVISION 2030 that centres around social responsiveness and societal impact. The initiative will bring together health promotion, physical activity, nutrition and mental health by delivering two core projects built on co-creation and participatory action. The first project, partnering with the University of Basel, Switzerland, Nelson Mandela University and University of Limpopo, will adapt the proven *KaziKidz* and *KaziHealth* programmes. By twinning schools across different socioeconomic quintiles, the Chair will promote health literacy for learners and workplace wellness for educators, tackling structural health disparities collaboratively. The second project, partnering with the University of Glasgow, United Kingdom and University of Cape Town, will engage adolescents directly as citizen scientists using photovoice technology. Youth will evaluate the barriers in their own schools and neighbourhoods – from physical activity, nutrition and mental health to health policy and policy legislation – and be trained in advocacy to present evidence-based solutions directly to decision-makers and policy leaders. It is envisaged that this Chair will expand into a Wellness Institute and absorb several relevant departments, or components thereof, across the different faculties to facilitate collaborative research and become a hub for wellness that serves our local community.

Chair in Sustainable Construction and Infrastructure Development

Professor Molusiwa Stephan Ramabodu



The proposed Chair aims to advance innovative and sustainable approaches to infrastructure delivery in South Africa, with a particular focus on rural and underserved communities. Rural infrastructure plays a critical role in improving access to essential services, stimulating economic development and reducing socio-economic disparities. However, infrastructure projects in these contexts often face persistent challenges, including weak governance structures, inefficient procurement systems, limited financial resources and inadequate stakeholder participation. The research programme will address these challenges through four integrated research streams: (1) infrastructure governance and policy for rural development; (2) technology integration for smart construction systems; (3) procurement guidelines for effective cost planning and project success; and (4) community-centric rural infrastructure development frameworks. These streams aim to develop evidence-based frameworks that improve efficiency, transparency, sustainability and stakeholder engagement in infrastructure delivery. The research will further explore the application of emerging digital technologies such as building information modelling (BIM), geographic information systems (GIS), blockchain and Internet of Things (IoT) solutions to enhance planning, monitoring and decision-making in construction projects. The Chair will develop and validate practical frameworks and guidelines for sustainable infrastructure development using a mixed-methods research design that includes literature reviews, stakeholder consultations, surveys and advanced analytical techniques. The research will contribute to national development priorities by strengthening governance, promoting responsible procurement, supporting community participation and integrating digital innovation into the built environment, thereby enabling more resilient, inclusive and sustainable infrastructure systems in South Africa.

Chair in Digital Transformation, Governance, SME Innovation, Education and Skills

Professor Olive Stumke



Prof Olive Stumke's Chair advances a research programme built on four interlocking themes: AI-driven public sector governance, digital transformation enablers, SME digital compliance and the future-proofing of accounting and auditing education. As convener of DUT's AI Task Team, she shapes institutional strategy on the responsible adoption of emerging technologies. An ideas-first innovator, Prof. Stumke conceptualises digital platforms that address real barriers to transformation, then partners with technical experts to bring them to life, an approach reflected in her portfolio of active intellectual property disclosures. Her work bridges governance, small-business innovation and skills development, positioning graduates and professionals to thrive in a rapidly digitising economy. Through the Chair, she builds cross-sector and international research collaborations that translate scholarship into practical tools for the public sector, SMEs and the professions. Her overarching goal is to ensure that digital transformation in South Africa is inclusive, well governed and grounded in strong human capital.

EXISTING RESEARCH INSTITUTES

02



01 INSTITUTE FOR WATER & WASTEWATER TECHNOLOGY (IWWT)

The Institute is led by an award-winning NRF-rated scientist, Prof Faizal Bux. The Institute encompasses a dynamic group of researchers involved in innovative research. Core research areas in the Institute are wastewater treatment technology, algal biotechnology and environmental biotechnology. The Institute offers postgraduate programmes in a wide spectrum of disciplines in Science and Engineering. The Institute is host to one of two NRF SARChI research chairs in wastewater treatment in South Africa.

Projects are designed and developed in order to meet the ever growing needs of the water sector in South Africa. These projects have a high applied value, which increases the marketability of students conducting the research. The Institute comprises well-equipped laboratories with state-of-the-art high-end equipment. It conducts short courses and training on a routine basis for staff from municipalities, water utilities and industry to improve their skills and keep abreast of the latest technology developments in the water and energy sector.



TEAM LEADER

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02 INSTITUTE OF SYSTEM SCIENCE (ISS)

The Institute was created from an existing Centre of Excellence to accomplish the following:

- Conduct high-calibre research into real-world questions using multidisciplinary computational and mathematical systems methods
- Develop simulation and mathematical methods to help understand these questions

Its aim is to affect a technology transfer of the methods and perspectives used to a broad group of South Africans. People at all levels of education, from high school to PhD level, are targeted with appropriate courses.



TEAM LEADER

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NEWLY ESTABLISHED RESEARCH INSTITUTES

18

The Durban University of Technology (DUT) has taken a decisive step towards advancing high-impact, interdisciplinary research through the establishment of 18 new Research Institutes, effective 2026. This landmark initiative strengthens the University's commitment to reinforcing its research profile and accelerates the translation of knowledge into innovation, entrepreneurship and meaningful societal impact, aligning with DUT's ENVISION2030 strategy.

The 18 Research Institutes span critical areas of science, technology, society and innovation. They include:





Smart grids, energy systems, grid modernisation, renewable-energy integration and resilient electricity infrastructure



Biocatalysis, green chemistry, enzyme technologies, bio-processes and sustainable industrial applications



BRICS cooperation, South-South knowledge systems, comparative development, global partnerships and policy-oriented research



Data science, artificial intelligence, analytics, machine learning, digital innovation and decision-support systems



**FUTURE OF
WORK &
EDUCATION**
RESEARCH INSTITUTE

Digital transformation, future skills,
work-integrated learning, educational
innovation and changing labour-market
systems



**INSTITUTE OF
ADVANCED
MANUFACTURING
& ROBOTICS**

Advanced manufacturing, robotics,
automation, Industry 4.0, smart
production systems and industrial
competitiveness



**INSTITUTE FOR
INNOVATION &
ENTREPRENEURSHIP**

Entrepreneurship, innovation
ecosystems, enterprise development,
commercialisation, start-up support and
socio-economic development



**INSTITUTE OF
BIOTECHNOLOGY
& HEALTH INNOVATION**

Biotechnology, health innovation,
bio-based solutions, diagnostics, public
health and translational research



INSTITUTE OF
**ENVIRONMENTAL &
CLIMATE CHANGE**

Climate resilience, environmental systems, sustainability, adaptation, mitigation and ecological impact



INSTITUTE OF
**HYDROGEN
TECHNOLOGY**

Clean energy, hydrogen systems, energy transition, green industrialisation and sustainable technology development



INSTITUTE OF
**INDIGENOUS FOOD
RESEARCH**

Indigenous foods, nutrition, food heritage, food innovation, local knowledge systems and sustainable food value chains



INSTITUTE OF
**HEALTH DEVICES
INNOVATION**

Health technologies, medical devices, biomedical innovation, assistive technologies and healthcare solutions



Ocean engineering, marine systems,
coastal technologies, blue economy
innovation and maritime research



Applied research for social
transformation, technology adoption,
development impact and community-
centred innovation



Space engineering, satellite technologies,
exploration systems, aerospace
applications and space-related
innovation



Urban futures, smart cities, spatial
planning, urban resilience, infrastructure
systems and inclusive city development



Micro-systems, nano-systems, advanced materials, sensing technologies and precision engineering



Food systems, agricultural technologies, sustainable farming, food security and climate-smart agriculture

INSTITUTES LAUNCHING THIS YEAR

06



The Institute is envisaged as advancing AI, machine learning, big-data analytics, healthcare analytics, smart cities and IoT, natural-language processing, ethical AI and AI for sustainable development. Its strategic opportunity is not to pursue every fashionable technology; it is to build the data, methods, governance and interdisciplinary partnerships that allow AI to work credibly in African environments. Durban and KwaZulu-Natal offer a distinctive research setting: a multilingual population; unequal digital access; complex metropolitan, township and rural systems; a major port and logistics economy; climate and infrastructure risks; high health-service demand; and public institutions that need better evidence without weakening rights or accountability. These conditions reward AI that is multilingual, data-efficient, explainable, secure, energy-aware and capable of operating under constrained connectivity and compute.



The Institute is focused on advancing entrepreneurship, innovation, commercialisation and enterprise development. The Institute generates evidence-based knowledge to support the creation, growth, sustainability and competitiveness of enterprises. Its key research focus areas include: Inclusive enterprise formation, survival and scaling; market access, value chains and digital trade; and innovation commercialisation and sustainable business models. The Institute contributes to inclusive economic growth, job creation and the development of entrepreneurial ecosystems and universities across South Africa and Africa through interdisciplinary research, postgraduate development and strategic partnerships.



The Institute is envisaged as a platform for advanced research in clean-energy technologies, including hydrogen production, storage, transportation and industrial applications, supported by laboratories, testing facilities, industry partnerships and postgraduate development. Three initial themes include two hydrogen production technologies, i.e., renewable green hydrogen production and biohydrogen production and hydrogen storage, and fuel cell and power distribution to create working demonstration plants.



The Institute repositions Africa's indigenous and underutilised foods at the centre of a healthy, sustainable and sovereign food future. Its purpose is to generate rigorous, transdisciplinary science on the nutritional, medicinal, cultural and commercial value of indigenous foods, and to translate that knowledge into nutrition, industry and policy impact for communities in South Africa, Africa and beyond. The Institute's work is organised around four complementary focus areas: sustainable protein innovation from indigenous crops (anchored by the NRF Tier I Research Chair); nutrition, health and 'food-as-medicine' for non-communicable-disease prevention; food processing, product innovation and value addition through to commercialisation; and food systems, indigenous knowledge, community rights, markets and policy. Underpinning these is a commitment to building world-class characterisation, processing and nutrition facilities, developing the next generation of scientists and food entrepreneurs, and forging strong national and international research partnerships.



The Institute exists to transform Africa's most pressing health challenges into safe, usable and locally-manufacturable technologies. Its activities are needs driven, spanning from a documented community need to a much-needed device. Anchored in KwaZulu-Natal as its living laboratory, the Institute operates across the full landscape of health device innovation, addressing diagnostic gaps at the frontline of care, advancing assistive and connected care technologies and building the translation systems that move promising devices from the bench into sustained real-world use. The Institute is driven by three integrated research themes: point-of-care diagnostics and essential clinical devices; assistive and rehabilitation technologies; and medtech translation and local manufacturing. The Institute brings together clinicians, engineers, data scientists, and communities across DUT's faculties of Health Sciences, Engineering and Built Environment, and Accounting and Informatics to collaborate across every discipline involved in getting a device from concept to a tangible product.



The Institute drives rigorous, science-based research into the challenges shaping fast-growing coastal cities, using Durban as a living laboratory to generate solutions relevant far beyond its borders. Its work spans four key areas: climate risk and resilient settlement planning, including city governance and leadership; the reliability of interconnected urban infrastructure such as water, energy, transport and digital systems; port-city mobility and freight-logistics, centred on the Port of Durban and its surrounding corridors; and the design of smarter, greener buildings and public spaces. These four themes share common research tools and data, ensuring the Institute's findings remain locally grounded yet applicable to similar coastal and rapidly-growing cities across Africa and the Global South.

ESTABLISHED CENTRE 01



INTERNATIONAL CENTRE OF NONVIOLENCE (ICON)

ICON's mission is to make strategic interventions in education that challenge structural violence. These processes work to bring key changes in society – specifically supporting the creation of a culture of non-violence. The majority of the research projects in the programme are based on action research, so that students not only explore a problem, but design and implement an intervention to bring about change.



TEAM LEADER

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01 EMERGING CENTRE



CENTRE FOR AFRICAN GOVERNANCE AND DEVELOPMENT (CAGD)

The aim of CAGD is to promote original research and transformative interventions to build more resilient African enterprises and communities by promoting good governance and sustainable development.

The CAGD sees its role as an international collective that advances governance and sustainable development through science, technology, engagement and innovation to positively impact communities and enterprises. Impactful and original research would be undertaken to develop transformative programmes that respond to change and critical citizenship. This would be done by developing fora for local, regional and international researchers and experts that act as a platform for analysing, debating and promoting governance and sustainable development policies in Africa.

Consequently, CAGD would provide professional and technical services to the public and private sectors with a view to enhancing their strategic, functional and operational effectiveness and efficiencies through technology, creativity and innovation. These activities would enable the Centre to complement and support entrepreneurship development and trade initiatives to enhance the local and African economy by advocating for robust economic, development and governance policies and practices.



TEAM LEADER

Professor Gift Mugano



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ESTABLISHED RESEARCH FOCUS AREAS 10



01 COMPOSITE RESEARCH GROUP (CRG)

The Composite Research Group has three foci:

- Composites, biocomposites and nanocomposites

Current research activities include the development of smart materials, nanosensors, nanocoatings, nanomembranes and polymer nanocomposites for a variety of applications, including aerospace and mass transit systems.



TEAM LEADER

Professor Mervyn Kanny



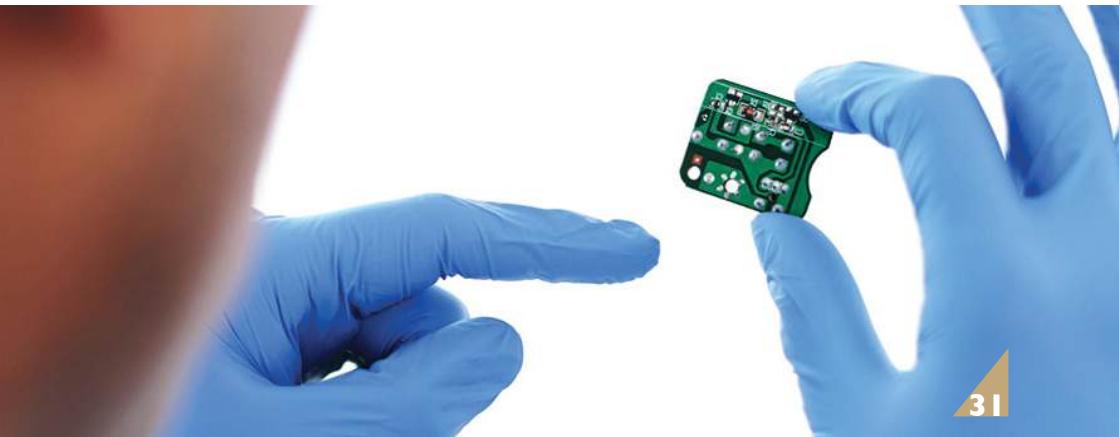
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02 COMPUTATIONAL MODELLING AND BIOANALYTICAL CHEMISTRY

The Computational Modelling and Bioanalytical Chemistry focus area comprises the following research groups in chemistry: ionic liquids, synthetic organic medicinal chemistry, phase equilibria and environmental chemistry. These primary research areas have contributed to more than 95% of the research outputs in the Department of Chemistry for this reporting period. It is also noteworthy that Chemistry has been the second most productive department in the Faculty of Applied Sciences in terms of research and innovation. Strategic partnerships in research have been formed with various institutions, both locally and abroad.



TEAM LEADER

Professor Bakusele Kabane



HOST

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03 ENERGY

The Renewable & Sustainable Energy Research Group (RSERG), which is housed within the KZN Industrial Energy Efficient Training & Resource Centre (IEETR), is a multidisciplinary research group spanning multiple faculties. Research is conducted in solar thermal, solar photovoltaics (PV), hybrid systems, energy management systems, microgrids, biogas, waste to energy, building energy and hydrogen energy. Research responds to a number of the United Nations' SDGs, namely: 7, 11, 13, 15 and 17. RSERG provides an energy research environment that combines innovation with research excellence, focusing on the development of new and innovative energy technologies and energy conservation in the industrial, retail, commercial and residential sectors.



TEAM LEADER

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04 ENZYME TECHNOLOGY

The Enzyme Technology Research Group (ETRG) at DUT, under the leadership of Prof Kugen Permaul, includes three other established researchers – Prof Suren Singh, Prof Tukayi Kudanga and Prof Santhosh Pillai. The research group has focused on critical research areas that have direct and indirect impacts on the environment as well as the biotechnology and food industries. Key areas of research are microbial enzyme production and application, biocatalysis, waste biomass valorisation, bioremediation, biopolymer synthesis and manipulation and food biopreservation. These fields are aligned with the DUT's Envision 2030 strategic objectives, the South African National Research Framework and the Sustainable Development Goals of the United Nations. Moreover, in addition to the scientific advancements and significant research outputs generated by these projects, the research has also contributed to postgraduate training and skill development through collaborative research at the national and international level. The group has extensive collaborations with national and international scientists and has attracted funding for flagship projects funded by BRICS, the USA and the EU as well as a host of bilateral grants. The group currently hosts the NRF/DST SARCHI research chair in Biovalorisation.



TEAM LEADER

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05 FOOD & NUTRITION SECURITY

The Food and Nutrition Security research focus area (RFA) is committed to developing sustainable solutions that enhance food and nutrition security, reduce poverty and address the rising burden of lifestyle and non-communicable diseases in vulnerable communities within South Africa and beyond. It brings together expertise in food science, nutrition, consumer science, biotechnology and community health to address critical challenges related to food availability, accessibility, utilisation and safety. Key research strengths include food product development, food chemistry and processing, food safety, community nutrition and nutrition-based interventions aimed at improving household nutrition and community well-being. The RFA also places strong emphasis on research commercialisation, innovation, postgraduate training, community engagement and technology transfer. Collectively, the group contributes to national and global initiatives aligned with the United Nations' Sustainable Development Goals through impactful and socially-responsive research.



TEAM LEADER

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06 GENDER JUSTICE AND HUMAN HEALTH DEVELOPMENT (GJHHD)

The RFA is involved in both research and capacity development. GJHHD is committed to interdisciplinary work and works with DUT colleagues across faculties. One of the main aims is to increase and strengthen gender research at DUT, increase the number of women who are publishing but also to have a close link between gender justice research, policy and intervention, both at DUT and in the broader society. GJHHD has thus appointed research associates who are active both in higher education and the public sector. Current and proposed projects include a focus on gender and tax, women academics and female students in a COVID-19/Post-COVID-19 world. Prospective projects are linked to issues of mental health and suicide in higher education and women.

GJHHD launched the Research and Doctoral Leadership Academy (RADLA) in 2020, which focuses on supporting academics to manage their careers in order to become full professors, leaders in academia, NRF-rated researchers and to supervise students successfully. The academy primarily supports academics who have already obtained their PhDs or have registered for a PhD. It assists academics to improve their credentials and thereby become excellent scholars.



TEAM LEADER

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07 GREEN ENGINEERING

The Green Engineering Research Group (GERG) is a flagship multidisciplinary RFA within the Department of Chemical Engineering at DUT. GERG advances solution-driven research across the water-energy nexus, addressing pressing global challenges in energy security, water sustainability, environmental management and climate resilience. Its current diverse research portfolio includes green hydrogen production and renewable energy systems, water and wastewater treatment technologies, waste valorisation and circular economy processes, advanced materials and nanotechnology, green catalysis, bioremediation, AI-driven process optimisation and computational modelling.

The group adopts an integrated research approach that combines laboratory-based research, pilot-scale experimentation and industry collaboration to ensure practical and scalable solutions. As a multidisciplinary platform, GERG is committed to innovation, capacity development, and technology transfer, while supporting the priorities of South Africa's Just Energy Transition and the United Nations' Sustainable Development Goals (6 and 7). The group contributes significantly to DUT's strategic objectives of research excellence, innovation and societal impact, while strengthening capacity development within the engineering, water and energy sectors.

GERG strengthens postgraduate training, collaborative research and technology development in support of South Africa's emerging hydrogen economy through strategic collaborations with organisations such as the South African National Energy Development Institute (SANEDI). Its SANEDI-funded Green Hydrogen Project also contributes significantly to the advancement of DUT's Institute of Hydrogen Technology through infrastructure development, pilot-scale demonstrations, specialised training and skills development initiatives. GERG aspires to become a leading research hub for sustainable engineering and hydrogen innovation, advancing research excellence, industrial relevance, inclusive socio-economic impact and long-term environmental sustainability.



TEAM LEADER

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08 PLANT BIOTECHNOLOGY

The Plant Biotechnology Research Group explores natural and synthetic plant-based pharmaceuticals, utilising indigenous species to develop accessible healthcare solutions for microbial and fungal infections, as well as chronic diseases like diabetes, tuberculosis, cancer and malaria, with a focus on rural communities. Key research areas include:

- Novel and synthetic chemistry of secondary metabolites
- Nanoparticle – secondary metabolite conjugates
- Structure-based molecular dynamics and evaluation

This group advances postgraduate education and development by connecting pharmaceutical chemistry with primary healthcare in South Africa through partnerships with local and international organisations. The Group aims to improve South African healthcare by developing culturally relevant pharmaceuticals from indigenous plants and promoting sustainable healthcare practices.



TEAM LEADER

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09 SPACE SCIENCE

The DUT Space Science & CNS Research Centre is a pioneering hub of scientific research, innovation and postgraduate development dedicated to advancing knowledge in space science, communication, navigation and surveillance technologies. The Centre fosters collaboration between academia, industry and government partners to address global challenges through cutting-edge research and innovation. The Centre is committed to developing future scientists, engineers and innovators while contributing to socio-economic growth, digital transformation and the advancement of Industry 4.0 in South Africa and beyond through funding opportunities, mentorship and research support for Honours, Master's and Doctoral students. The programme aims to provide postgraduate support in space sciences across a wide range of disciplines, including satellite communications; terrestrial communications, navigation and surveillance (CNS); radio and telecommunication; engineering; monitoring and tracking; satellite determination and navigation (marine or aeronautical); electronics, electrical and mechanical engineering; physics and chemical science; surveying and GIS science; maritime, road, rail and aeronautical science; as well as computer science, ICT and marketing management.



TEAM LEADER

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10 SMART GRID

Every facet of human development is woven around a sound and stable energy supply system. DUT Smart Grid RFA engages in research relating to 'grid integration of renewable energy using power electronics and innovation for intelligent cities', using Industry 4.0 tools and applications in electrical power and energy systems, to solve problems of loadshedding and security of supply. Smart grids are electrical grids merging bidirectional power flow with information flow to monitor changes in electricity usage and supply using digital communications technology to detect and react to usage of the electrical supply and integration into the power grid.



TEAM LEADER

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EMERGING RESEARCH FOCUS AREAS

04



01 GLOBAL HEALTH AND SUSTAINABILITY

The Global Health and Sustainability RFA serves as the central node for a network of projects, institutions, practitioners and academics interested in public health research, locally (in Durban and South Africa) and globally. The RFA is strategically named as it provides a creative space for projects and collaborations that address global health issues with a key focus on the United Nations' SDG 3: Towards Good Health and Well-being. The sustainability component of this name aims to develop projects that are relevant and sustainable, beyond the timelines and resources of any project undertaken. This RFA is aligned to and aims to fulfil the global, continental, national and institutional strategy/objectives, in keeping with the SDGs 2030, National Development Plan 2030 and ENVISION 2030.



TEAM LEADER

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02 ICT AND SOCIETY

ICT and Society is committed to advancing the field of ICT by means of quality research. The core focus is developing contemporary and futuristic ICT innovations for foreseeable real-world problems and opportunities. ICT and Society supports quality research within the greater computing discipline and multi-disciplinary Master's and PhDs.



TEAM LEADER

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03 MATERNAL HEALTH

The aim of the project is to respond to the United Nations' SDGs 3 and 4 by decreasing maternal morbidity and mortality rates and ultimately aligning these goals to the burden of diseases and health systems responses in South Africa and other countries. The focus is to determine the demographic, socio-economic, psychosocial, cultural, antenatal, obstetric, clinical and biochemical characteristics associated with maternal health and birth outcomes.



TEAM LEADER

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04 TRANSFORMATION THROUGH THE ARTS AND DESIGN

Our broad aim is to cultivate a faculty of arts and design that promotes multi-inter-transdisciplinary, decolonial and critical approaches to the teaching, output and trajectories of arts and design and humanities. Our research focuses on critical and creative arts, cultural work, pedagogy, practice and intellectual discourse that is socially engaged, responsible, historically and spatially situated, as well as dialogically focused in order to engage local and global discursive terrains, debates and movements.



TEAM LEADER

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