

Vaal University of Technology

Leading Innovative Knowledge and Quality Technology Education

Vaal University of Technology (VUT) derives its origins from the college of advanced Technical Education and was established in 1966. In 2004, the new government found it fitting to establish the VUT, as one of six such institutions within the country, to focus on Science and Technology and the provision of high-level skills, not for the Vaal Triangle region and the country, but also for the SADC region and the continent. The institution now boast a student headcount of approximately 21 000.

VUT has a population of about 1 000 international students coming from over 35 countries and continues to grow.

The VUT has grown in stature and size as a Higher Education institution, drawing students from all over the African continent and beyond. VUT has a population of about 1 000 international students coming from over 35 countries and continues to grow. In the last five years, VUT has hosted exchange students from Germany, the Netherlands, France, Nigeria, Somalia, Kenya and Namibia.

International Relations and Advancement

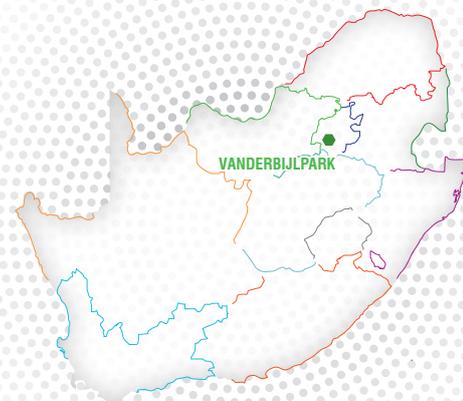
- Strategically position the VUT in the global stage
- Initiate, plan, manage and coordinate international relations networks, joint research projects, agreements and partnerships
- Counsel and advise international students on immigration and university policies
- Plan and coordinate programmes for integrating international students in and off campus
- Undertake research on international partners/and or students so as to improve the experience for students
- To manage and coordinate publicity and community engagement programmes

Social Justice and Transformation (SJT) Unit

The University drives its transformation agenda through the SJT Unit, this involves developing strategies and policies which affirms learning and working experiences of international students and staff. The end game is to have international students and staff who feel not only at home but are treated as valuable members of the VUT community. International staff and students are made to feel at home through participation in various social inclusion initiatives.



VUT
Vaal University of Technology
Your world to a better future



Values

- Excellence
- Creativity
- Mutual Respect
- Collegiality
- Honesty and Integrity
- Tolerance
- Diversity

The institution now boast a student headcount of approximately 21 000.



Faculties

- Management Sciences
- Applied and Computer Sciences
- Engineering and Technology
- Human Sciences

Vaal University Research Directorate

The Centre of Sustainable Livelihoods

Vision: The vision of the Centre of Sustainable Livelihoods is to use research as a tool aimed at reducing poverty, household food insecurity and malnutrition in Africa.

The Centre of Sustainable Livelihoods is a postgraduate research directorate of the Vaal University of Technology Research hub, with the focus on using research as a tool to reduce poverty, household food insecurity and malnutrition in Africa.

In recent years, we have focused on poverty, malnutrition and household food insecurity in rural, peri-urban and urban communities in the Vaal region, Qwa-Qwa, Eastern Cape, Soshanguve, Hammanskraal and various African countries.

The close relationship that the Centre of Sustainable Livelihoods has with these communities has helped us to create a relevant research programme with a high level of implementation. This has led to the malnutrition.

Centre for Alternative Energy

The research focus on Alternative Energy, Applied Electronics and NRF/THRIP defined focus areas:

1. Alternative Energy:

- The development of fuel cells and fuel cell membranes
- Hydrogen generation and storage
- Sustainable electricity for rural communities through solar, wind and fuel cell energy

2. Dielectric Heating:

- Radio frequency heating and drying of materials
- Rock comminution for mining
- Blood heating

3. Product Development:

- Applied electronic products for a vast number of commercial applications
- DC-DC converters and DC-AC inverters

Technology Transfer and Innovation

The Innovative Product Development and Advanced Manufacturing research focus area includes the technology, tools, procedures and work organisation used for the increased efficiency in industrial product development processes. Our research is focused on the use of Additive Manufacturing platforms which will increase efficiency in product development processes.

We investigate key factors for competitive industrial product development and innovation by using tools and procedures, as

well as organisational co-operation and parallel processes. This holistic approach includes the integration of all relevant aspects of product development processes.

We have an excellent history of collaboration with industry, national and international academia and participation in Government Flagship programs. Our long history with government programmes also provides sufficient expertise and an established track record in obtaining triple helix-based research and support grants.

Materials and minerals technology materials and minerals technology

The aim of the Materials and Minerals Technology research focus area has always been to build research covering a broad spectrum of materials science and technology. This aims to fulfil the needs of the technology Station in Process and Materials Technology while at the same time providing a research vehicle for the departments of Metallurgical, Civil and Industrial Engineering.

Materials selection is central to all manufacturing and construction design and development. Therefore, the importance of on-going research into materials' properties and the development of new materials should always be underscored.

Services Offered by the Materials and Minerals Technology Focus Research Area

Our work is aimed towards:

- Contract research
- In-house and collaborative green-fields research in the fields of engineering materials
- services
- Technology transfer
- Postgraduate training

Plant Molecular Genetics/Biotechnology

The Plant Molecular Genetics / Biotechnology focus area is housed in the Department of Biotechnology and is led by Professor Michael Pillay. Current research topics in these areas revolve around Genetic Diversity, Gene Discovery, Agricultural and Environmental Biotechnology. New avenues of research such as Proteomics have also been initiated.

The practicality of our research ideas and the availability of basic laboratory equipment have helped to attract students to continue with their postgraduate studies at VUT. The Department of Biotechnology will soon be offering a PhD in Biotechnology, pending final approval from DHET.

Centre for Renewable Energy and Water Energy and Water

Mission

To develop research cultural capital, exploit the competencies at the interface of disciplines and engage in research driven by effective teaching and learning.



Background:

The grand global challenges of our time include access to clean water, global warming, affordable energy and food security. Efforts to address these challenges are constrained by the fact that the natural resources are being depleted while the need continues to rise with the increase in global population. This means that as far as water and energy provision is concerned, the world has less for more. To address this problem, scientists have in the recent years adopted a strategy that is aimed at developing technologies for creating more with less. At the centre of this strategy is the use of low-cost materials and technologies based on regional or site specific conditions. This strategy must be guided by the national imperatives, with the aim of exploiting regional competitive advantages.

Please visit www.vut-research.ac.za for more information and contact details

Research That Matters

VUT research outputs for 2013-2017

Year	Unit
2013	99
2014	108
2015	78
2016	115
2017	135

Research outputs for 2017

Research outputs per faculty	Units
1. Engineering and Technology	22
2. Human Sciences	17
3. Applied Computer Sciences	51
4. Management Sciences	43
5. Non-Faculty	3

Vaal University of Technology Southern Gauteng Science And Technology Park

A unique world class advanced manufacturing precinct to assist entrepreneurs develop products prototypes and employs engineers, scientists, design and additive manufacturing specialists

- The university owns 172 hectares of land with infrastructure such as large auditoriums, office space and incubation facilities.
- It is located within a community of Sebokeng and surrounded major industrial partners such as Arcelor Mittal, Sasol, etc.



Strategic Focus Areas

Aligned with government priorities and with our competitive advantage, we will service clients in various sectors such as Fashion, Hospitality & Tourism and Information & Communication Technology (ICT), however, our strategic selected focus areas include:

- Enterprise Development Unit
- Advanced Manufacturing Precinct
- Technology Station
- Footwear and Leather
- Casting and Simulation Network
- EOU
- F'SASEC
- Product Design and Development

Advanced Manufacturing Precinct (AMP)

The AMP focuses on advanced product design and manufacturing for industries, particularly in the foundry and pioneering manufacturing sector. This facility functions as a service bureau, supporting local industry and entrepreneurs, as well as providing local and international research support.

It currently offers the highest resolution polymer laser sintering in South Africa.

Our additive manufacturing (AM) facility offers a range of prototyping and manufacturing technologies, including Binder Jetting, fused deposition modelling and laser sintering. The facility has the ability to create useable prototypes and final components quickly and accurately, in a range of materials.

AMP offers the following services:

- Advanced design
- Advanced manufacturing using state-of-the-art technology in 3D printing



Technology Station (TS)

The Technology Station focuses on assisting small and medium size enterprises, manufacturers and VUT staff and students in attaining their maximum potential to enable them to contribute to economic growth, job creation and skills development in South Africa. To achieve this, the Technology Station provides solution-orientated expert and training services in composites and metals-based products through its station units which are industrial design and development, robotic milling, tooling and manufacturing as well as the idea to product lab.

Technology Station offers the following services:

- Industrial design
- Product and process improvement
- Training & technology demonstration
- Testing and analysis
- Prototyping

The French South African Schneider Electric Center (F'SASEC)

The French South African Schneider Electric Center in association with the VUT, takes pride in empowering the youth and the Vaal community.

This centre was established in February 2011 by the by the French Ministry of Education, to equip less privileged students with practical experience and deeper knowledge of electrical engineering as well as creating a pathway for students from matric and TVET colleges to enter mainstream universities.

Centre Of Footwear Entrepreneurship (CfE)

The CfE aims to become more competitive through innovation, skills development and technology transfer. Our mission is to build and improve capacity in the manufacturing and related value chain of the footwear, leather and leather goods sectors in South Africa – and strengthen skills development and product development through design.

CoFE provides the following specialised services:

- Benchmarking Technology Demonstration
- Footwear Design Component Development
- Incubation
- Shared resources facilities

Energy Optimisation Unit

Alternative energy involves the development of systems utilising photovoltaic, fuel cell and fermentation technology, including those generating both alternative electricity and heat. Water management entails the development of sustainable systems to ensure water supply and quality, as well as preserving the waste and contamination of available water resources.

The EOU has two main focus areas:

- Alternative methods of energy production for industrial and domestic uses
- Management of water resources

Dihlare

Local traditional knowledge has been used to develop a range of medicinal products, however, for these to be more widely accepted in the market, clinical and scientific testing and

certification needs to be implemented. Dihlare Remedy (Pty) Ltd serves to enable this through applied research.

The institute is currently working on two portfolios:

- Research and Development
- Education and Training

Casting and Simulation Network

The casting simulation network provides local foundries, including small and medium enterprises, with access to casting process simulation software and skills to enable the revitalisation of the South African foundry industry.

The program offers the following capabilities:

- CAD capabilities/ reverse engineering
- MAGMA casting simulation
- Project management
- Consulting
- Casting simulation training

Design and Development

The product development team consists of industrial design, engineering, additive manufacturing (AM) and tooling specialists. A typical design project will start with 2D concepts and 3D components.

Industrial designers assist in the aesthetics or visual appearance of the product. They add artistic elements to the product's enclosure to make it more attractive for the intended market. Other design elements include ergonomics, man-machine interface (MMI), costs and manufacturing methods and appropriate materials.

Enterprise Development Unit

The Enterprise Development Unit (EDU) supports researchers and entrepreneurs to identify, protect and commercialise products emanating from viable projects.

The EDU also offers the following services:

- Intellectual Property Services (identify and protect Intellectual Property);
- Commercialisation Services
- Legal Support Services

Vaal University of Technology
International Relations and Advancement
Private Bag X021
Vanderbijlpark, 1900
South Africa

Tel: +27 (0)16 950 9318
Fax: +27 (0)16 950 9768
E-mail: international@vut.ac.za

Website: www.vut.ac.za