Faculty of Engineering, Built Environment and Information Technology
Fakulteit Ingenieurswese, Bou-omgewing en Inligtingtegnologie / Lefapha la Boetšenere, Tikologo ya Kago le Theknolotši ya Tshedimošo
UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Internal Faculty Newsletter

EBIT LINK

Innovating our tomorrow

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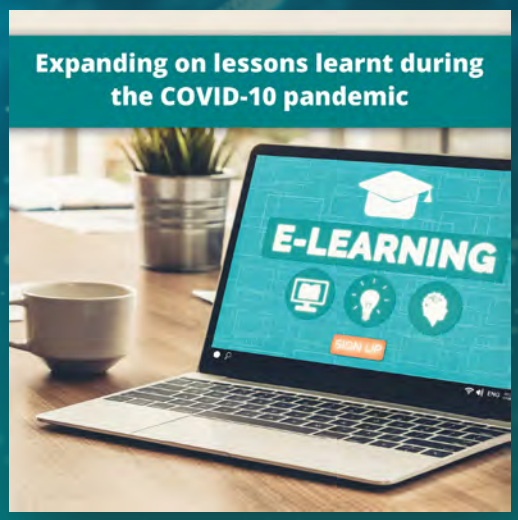

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message from the DEAN

The Office of the Dean is proud to present this first edition of EBIT Link, the Faculty's internal newsletter, which aims to inform EBIT's staff of exciting developments and innovations in the Faculty. Our staff are our most valuable asset in the Faculty's quest to develop a generation of problem-solvers and innovators who are ready to change the world. Both academic and support staff members actively contribute towards the realisation of this goal.

In this issue, we feature three of the Faculty's exceptional scholars, who have joined its leadership ranks as Head of Department: Prof Michael Daramola (Chemical Engineering), Prof Ina Fourie (Information Science) and Prof Raj Naidoo (Electrical, Electronic and Computer Engineering). We also congratulate three of the Faculty's researchers for achieving new ratings from the National Research Foundation (NRF), and two researchers for being nominated for the prestigious NSTF-South 32 Awards of the National Science and Technology Forum (NSTF). This is a clear testament to the outstanding contributions of the Faculty's researchers to science, engineering, technology and innovation in the country.

A number of highlights for the Faculty have been featured in the media recently, and it is a pleasure for me to share them with you. I trust that you will join me in celebrating the achievements of our fellow staff members as we find new ways of innovating our tomorrow.

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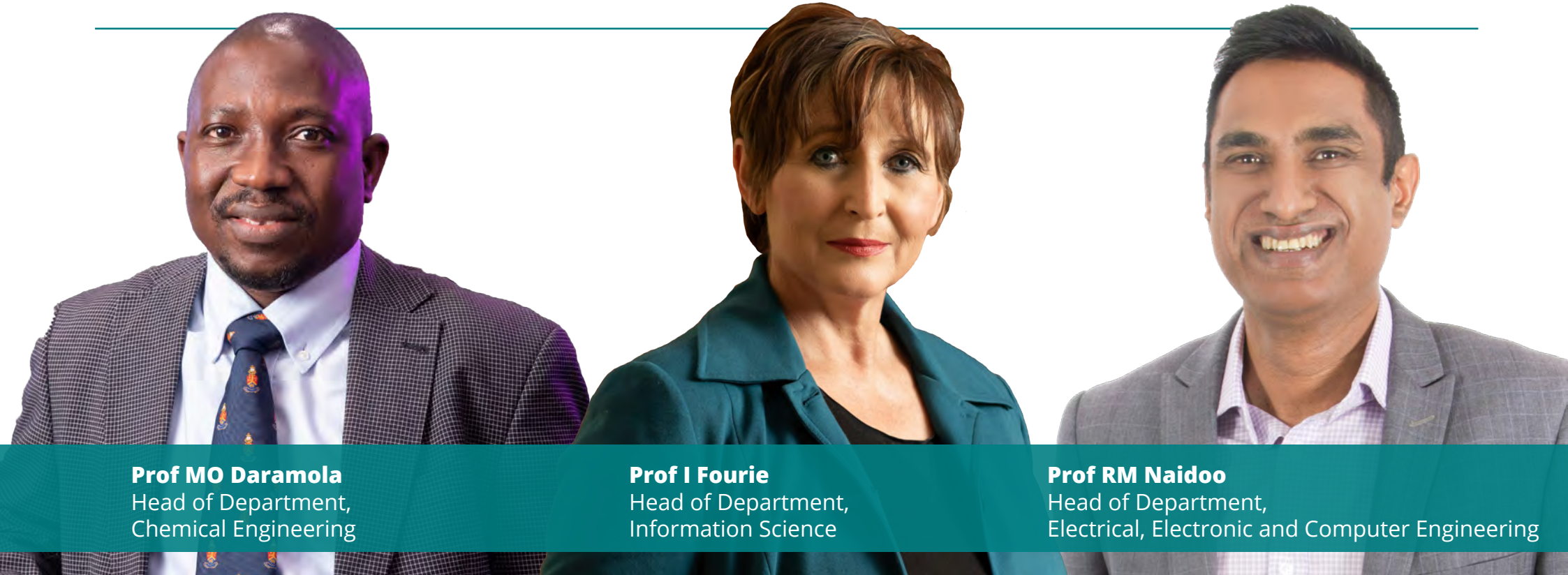
THE FACULTY IS PROUD TO WELCOME THREE EXCEPTIONAL SCHOLARS TO ITS LEADERSHIP RANKS



Prof MO Daramola
Head of Department,
Chemical Engineering

Prof I Fourie
Head of Department,
Information Science

Prof RM Naidoo
Head of Department,
Electrical, Electronic and Computer Engineering

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EBIT Dean, Prof Sunil Maharaj, appointed as the Chair of the Global Engineering Deans Council (GEDC)

Prof Maharaj is the first Dean in Africa to occupy this position. He will work as Chair-Elect during 2021 alongside the current Chair, Dean Sirin Tekinay of the American University of Sharjah, and will assume the chairship in November 2021. In this leadership role, he will work closely with leaders throughout the world until the end of 2023 and will work closely with the International Federation of Engineering Education Societies, which links global organisations, professors, students, corporate entities, UN agencies and other multilateral global organisations, as well as leaders throughout the world.

The GEDC's vision is to enhance the capabilities of engineering deans to transform engineering schools in support of societies in a global economy. As a global network, it can leverage its collective strengths for the advancement of engineering education and research.

The GEDC's network includes over 500 leaders and stakeholders representing over 40 countries from all continents. Prof Maharaj believes that there is a need for universities in the developing world to innovate by constantly promoting "disruptive engineering".

South Africa is the only country in sub-Saharan Africa that is part of international accreditation bodies, including being a signatory to the Washington Accord. Representatives of the GEDC commend Prof Maharaj's deep commitment to strengthen the role of African universities.

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New ratings for top EBIT researchers

National Research Foundation

The National Research Foundation (NRF) rating system is a key driver in the NRF's aim to build a globally competitive science system in South Africa. It is a valuable tool for benchmarking the quality of our researchers against the best in the world. NRF ratings are allocated based on a researcher's recent research outputs and impact as perceived by international peer reviewers.

READ MORE

B3

Prof VSS Yadavalli
Head of Department, Industrial and Systems Engineering

internationally acclaimed researcher

B2

Prof I Fourie
Head of Department, Information Science

significant international recognition for high-quality research outputs

C2

Prof M Holmner
Department of Information Science

established researcher in her research field

NSTF-SOUTH32 NOMINATIONS

The NSTF Awards are the flagship project of the National Science and Technology Forum (NSTF), in partnership with South32. The NSTF Awards honour and celebrate outstanding contributions to science, engineering and technology (SET) and innovation. The NSTF Awards have grown to be the largest and most prestigious public SET and innovation awards in South Africa.

EBIT CONGRATULATES TWO OF ITS SCHOLARS ON BEING SHORTLISTED NOMINEES FOR THE 2021 NSTF-SOUTH32 AWARDS

Prof Jan Eloff
Deputy Dean: Research and Postgraduate Studies, Faculty of Engineering, Built Environment and Information Technology

Dr Vukosi Marivate
Absa Chair of Data Science, Department of Computer Science

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2021 QS WORLD UNIVERSITY SUBJECT RANKINGS

The latest edition of the QS World University Subject Rankings illustrates the Faculty of Engineering, Built Environment and Information Technology's commitment to becoming a world-class research institution and to expanding its innovation footprint.

According to the 2021 QS World University Subject Rankings, the University of Pretoria is one of only two universities in South Africa to be ranked in the top 400 universities globally for engineering and technology. This year, the University appeared in five categories for electrical and electronic engineering, chemical engineering, mechanical, aeronautical and manufacturing engineering, computer science and information systems, and mineral and mining engineering.

The Faculty's Department of Electrical, Electronic and Computer Engineering is the domestic leader in the field of electrical and electronic engineering, having been ranked number one. The Faculty is also particularly proud of the achievements of both the Department of Materials Science and Metallurgical Engineering, and the Department of Mining Engineering for cracking the top 50 ranking for the first time. In addition to this achievement, the Metallurgical Engineering degree programme offered by the Department of Materials Science and Metallurgical Engineering has been ranked the best of its kind in South Africa for 2020 by the Minerals Education Trust Fund (METF). This is the second consecutive year that the Department has achieved this feat.

ELECTRICAL AND ELECTRONIC ENGINEERING

TOP 251–300

CHEMICAL ENGINEERING

TOP 301–350

MECHANICAL, AERONAUTICAL AND MANUFACTURING ENGINEERING

TOP 301–350

COMPUTER SCIENCE AND INFORMATION SYSTEMS

TOP 451–500

MINERAL AND MINING ENGINEERING

TOP 48

Prof Evans Chirwa receives a special award from the Water Institute of South Africa

Professor and incumbent of the Rand Water and Sedibeng Water Research Chairs in Water Utilisation Engineering, Prof Evans Chirwa, from Chemical Engineering, Faculty of Engineering Built Environment and Information Technology (EBIT), University of Pretoria has been elected by the board as a Senior Fellow of the Water Institute of South Africa (SFWISA). This honour is for the dedication and support that Prof Chirwa has shown the Water Institute of South Africa (WISA), and the Water Sector throughout his career. Through this award Prof Chirwa joins the ranks of highly respected South African academics and professionals in the Water sector, including Prof George Ekama (UCT), Prof Eugene Cloete (SU), Prof Bhekie Mamba (UNISA), Prof Alvin Lagardien (CPUT) and Prof Faizal Bux (DUT).

Prof Chirwa's contribution to the department and the water industry is highly recognised in numerous awards he has received over the years. Through his research into various pertinent issues related to water quality and the concomitant impact on the environment Prof Chirwa has made significant contributions to the Water landscape both nationally and internationally. This impact was recognised by the NRF National Equipment Plan funding instrument in 2019 through the acquisition of a first-on-the-continent hyphenated Ion Chromatograph-Quadrupole/Time of Flight analytical system.

In his letter to Prof Chirwa, Mr Dan Naidoo, WISA Board Chair said "This exceptional honour is not bestowed lightly and takes into consideration the consistency of support that Prof Chirwa have shown WISA over a large number of years. It is however not restricted to support for WISA, but also takes note of the contributions he had made to the enhancement of the Water Sector overall, and the esteem that his actions have brought to the stature of the South African water industry."

The department proudly congratulates Prof Chirwa for his achievements and this extra-ordinary honour. In his congratulatory message, Prof Michael Daramola, the Head of the Department expanded by expressing that "This is an extra-ordinary award bestowed on an individual who has made immense contributions to the field of water and sanitation engineering."

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BRICS support for nationwide collaboration to strengthen the fight against COVID-19

As part of concerted efforts in Brazil, Russia, India, China and South Africa to control and mitigate the COVID-19 pandemic, the BRICS Science, Technology and Innovation (STI) Framework Programme has allocated more than R30 million for research to strengthen the fight against the disease. Prof Hanlie Smuts, a researcher in the University of Pretoria's Department of Informatics, is one of the awardees appointed to lead a multilateral innovation research project to facilitate collaboration among researchers and institutions across the member countries of the BRICS alliance.

The research project on which Prof Smuts is the principal investigator combines the expertise of researchers in Brazil, Russia and South Africa. Titled "BRICS-ICT alliance for smart resource utilisation to combat global pandemic outbreaks", the project will be known by the acronym BRICSmart. It addresses the areas of artificial intelligence (AI) and information and communication technology (ICT), and how these topics may be applied to address issues around pandemics.

The digital technology associated with the constructs of prediction, modelling and simulation points to the application of AI, machine learning, modelling both space and time, and visualising real-world scenarios. Such technologies may support and facilitate pandemic strategy, preparedness and response in multiple ways, including the identification and tracking – in real time – of pandemic activity, such as individuals who might have been in contact with an infected person. Digital technologies also support global supply chain scenario planning and focus on production scheduling capability and enhancing the visibility of inbound materials.

Viewing COVID-19 through the lens of systems thinking and representation ensures that policy makers do not merely maintain a linear view of a country. Seeing the pandemic as an inter-related system will inform preparedness and smart resource utilisation strategies, and support governments to pull the right levers to get the economy and society back on track after pandemic-related shocks and crises. Furthermore, by emphasising efficiency in the operation, management and outcomes of various components of the system, smart resource utilisation may be achieved while combatting the pandemic.

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Award for African machine learning interface

The Masakhane natural language processing (NLP) research project, an African machine translation web interface, has won the inaugural 2021 Wikimedia Foundation Research Award of the Year. This system was developed by the Data Science for Social Impact (DSFSI) research group in the Department of Computer Science, in collaboration with researchers from the African Master's in Machine Intelligence programme of the African Institute for Mathematical Sciences in Ghana.

Despite the fact that 2 000 of the world's languages are African, African languages are barely represented in technology. This is further exacerbated by the continent's colonialist past, which has been devastating for African languages in terms of their support, preservation and integration, and has resulted in technological space that does not understand African names, cultures, places or history.

The idea for a machine learning tool to assist in the translation of 50 of the regional languages on the continent was developed at the #SautiYetu African NLP Unconference 2020. This event is linked to the Deep Learning Indaba, an organisation focused on strengthening African machine learning (ML) and supporting Africans to be owners of technology advances and artificial intelligence (AI). An objective of the Indaba is to create leadership and recognise excellence in the development of ML and AI across Africa.

A two-year participatory research project spanning different countries in Africa was launched in 2019 with the assistance of funding received from the Mozilla Open Source Support (MOSS) Foundation. Dr Vukosi Marivate, holder of the Absa Chair of Data Science, is one of the chief investigators on this project. Research outputs included the publication of two journal articles, as well as an electronic application similar to Google Translate, but focusing specifically on the African languages for which accommodation is not made in existing machine translation tools.

"The research that formed part of the development of the Masakhane machine translation tool attempted to fundamentally change how the challenge of 'low-resourced languages' is approached in Africa."

VIEW THE MASAKHANE TOOL

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Engineering faculties perfectly placed to be at forefront of expanding on lessons learnt during the COVID-19 pandemic

EXPERT OPINION: PROF SUNIL MAHARAJ

The COVID-19 pandemic has brought significant change to all sectors and spheres around the world, and higher engineering education has not been spared. Any form of disruption gives one pause to rethink how things are done, as one cannot play the same game by the same old rules. While there is no need for concern regarding the state of engineering education at universities in the developing world, there remains a need to innovate by constantly promoting disruptive approaches to higher education in an effort to stay relevant for the future world of work.

With the rapid spread of COVID-19, academics the world over were impelled to embrace remote teaching and learning. Taking classes online was a challenge: lecturers had to prepare material for online purposes, be adept in engaging with students remotely, assess them online, and prepare online-based tests and exams. At many African universities, in particular, there were students who did not have laptops or access to the internet; in such cases, universities had to step in to ensure that these students could continue with their studies so that no student was left behind.

Engineering studies also generally involve laboratory work, and with students not being able to physically work in labs, academic staff had to reimagine ways to do this sort of work online. One way among various approaches in which the University of Pretoria achieved this was by students making video recordings of experiments in which they described the process or could do simple experiments at home. They would then engage online with their lecturers and peers.

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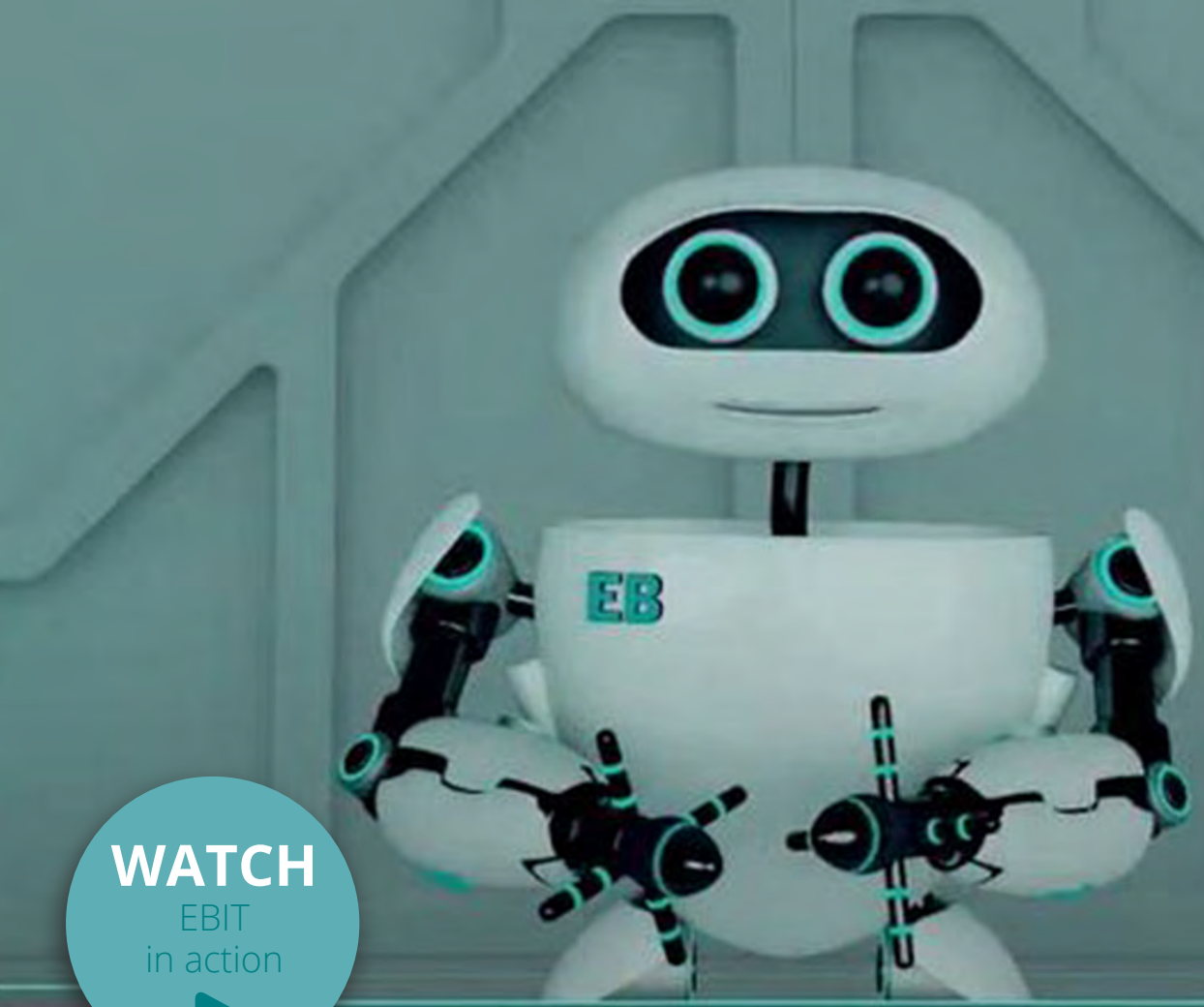

WATCH
EBIT
in action

EMBRACING TECH FOR OUR ALL-NEW **OPEN DAY**

On Saturday, 17 April 2021, the Faculty hosted an online EBIT Open Day to introduce its traditional EBIT Week, which has been a regular biannual event for more than 20 years. Due to the exceptional circumstances brought about by the COVID-19 pandemic in 2020, the Faculty decided to take advantage of technology to host the EBIT Week online. This year, technology enabled us to extend the invitation to learners in Grades 8 and 9. The Faculty has now put its money where its mouth is with regard to embracing the Fourth Industrial Revolution by collaborating with an external company, Spatial Multimedia, to present a high-tech programme that attracted more than 300 learners from across South Africa and its neighbouring countries. Using technology, the Faculty's first mascot, EB, was introduced to the public and welcomed learners to the Faculty. The Marketing Department wishes to express its gratitude to each staff member who gave their time and input to make the Open Day possible. Thanks also to Sizwile Dlamini, Charles Ncubuka, Taylor van der Westhuizen and his mentee Tyron Beverley for their assistance during the programme. We look forward to strengthening our relationship with learners.

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Get to know your FACULTY

The Faculty of Engineering, Built Environment and Information Technology (EBIT) is the largest faculty at the University of Pretoria (UP). It is also the only faculty at a South African university with the unique combination of academic departments in the fields of engineering, the built environment and IT.

EBIT IS PROUDLY BRANDED WITH ITS TEAL COLOUR. THIS DISTINGUISHES EBIT FROM THE OTHER UP FACULTIES, AND RECOGNISES FACULTY DEPARTMENTS AND INITIATIVES.

QUICK FACTS

30 RESEARCH CHAIRS AND ENTITIES

92 NRF-RATED RESEARCHERS

2 NRF A-RATED RESEARCHERS

FIVE INTERNATIONAL QS-RATED RESEARCH FIELDS

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Faculty of Engineering, Built Environment and Information Technology

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DEAN
PROF SUNIL MAHARAJ

DEPUTY DEAN: TEACHING AND LEARNING
PROF ALTA VAN DER MERWE

DEPUTY DEAN: RESEARCH AND POSTGRADUATE STUDIES
PROF JAN ELOFF

SCHOOL CHAIRS

PROF WJVDM STEYN
SCHOOL OF ENGINEERING

PROF C DU PLESSIS
SCHOOL FOR THE BUILT ENVIRONMENT

PROF C DE VILLIERS
SCHOOL OF INFORMATION TECHNOLOGY

PROF E VAN DER LINGEN
GRADUATE SCHOOL OF TECHNOLOGY MANAGEMENT (GSTM)

MS MANAGA DEVAR, FACULTY MANAGER: FACULTY OF ENGINEERING, BUILT ENVIRONMENT AND INFORMATION TECHNOLOGY

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WELCOME TO THESE EBIT AMBASSADORS

New appointments* make a meaningful contribution to our future.

Dr GL Coetzee
Senior Lecturer (Department of Civil Engineering)
Mr SV Debising
Instructor (Department of Mechanical and Aeronautical Engineering)
Mr AR Eskajee
Manager: Engineering 4.0 Facility (Department of Civil Engineering)
Mr R Hanslo
Lecturer (Department of Informatics)
Mr WK Hauger
Lecturer (Department of Computer Science)
Ms H Helm
Departmental Administrator (Department of Industrial and Systems Engineering)
Ms RA Mennega
Lecturer (Department of Informatics)
Mr TS Mokobodi
Lecturer (Department of Mechanical and Aeronautical Engineering)
Mr B Mokoka
Departmental Administrator (Department of Industrial and Systems Engineering)
Ms D Mkhabela
Departmental Administrator (Department of Electrical, Electronic and Computer Engineering)
Mr S Shongwe
Lecturer (Department of Architecture)
Mr N Sithole
Administrative Officer (Department of Engineering and Technology Management)
Ms M Voller
Departmental Administrator (Department of Information Science)

** January to March 2021*

*Congratulations to the following members of staff on their promotions**

Dr X Ye
Associate Professor (Department of Electrical, Electronic and Computer Engineering)
Dr O Adetunji
Associate Professor (Department of Industrial and Systems Engineering)
Dr MC Bekker
Associate Professor (Department of Engineering and Technology Management)
Prof DF Malan
Professor (Department of Mining Engineering)
Prof M Sharifpur
Professor (Department of Mechanical and Aeronautical Engineering)
Prof N Musee
Professor (Department of Chemical Engineering)
Prof FJWJ Labuschagne
Professor (Department of Chemical Engineering)
Dr S Skorpen
Senior Lecturer (Department of Civil Engineering)
Dr AS Bosman
Senior Lecturer (Department of Computer Science)
Dr HA Hammersma
Senior Researcher (Department of Mechanical and Aeronautical Engineering)

The next generation

Congratulations to the following families on the birth of their children:

Ms N Combo • Dr HA Hamersma
Mr D Keetse • Mr P Kruger
Prof HC Myburgh • Ms L Rix
Ms J Qoko • Ms C Vinson

Celebrating a lifetime of commitment

Retirement
We thank you for your contribution to the future through your work in the Faculty.

Prof W Focke
Department of Chemical Engineering (re-appointed)
Ms EM Gudmanz
Department of Mining Engineering
Ms JM van Heerden
Department of Industrial and Systems Engineering

Condolences
Our hearts go out to the family of **Ms AC Mushane** with her passing.