

MEDIA RELEASE

UP engineering students prepare learners for STEM careers through Tuks Robot School programme

As part of the University of Pretoria's (UP) Tuks Robot School programme, students from the Faculty of Engineering, Built Environment and Information Technology (EBIT) have been teaching learners from underprivileged township and rural schools about robotics, computer programming and sensor technology to increase interest in science, technology, engineering and mathematics (STEM) careers and prepare them for the future world of work.

The programme was inspired by UP's 10-year-old annual Robot Car Race, which saw many asking the University's Department of Electrical, Electronic and Computer Engineering (EECE) and Unit for Community Engagement to initiate a similar experience for school learners. The Tuks Robot School was founded in 2021 and gives UP students an opportunity to transfer their skills to high school learners.

A curriculum that targets Grades 8 to 11 learners was designed around a low-cost robot platform, and several senior EECE students were given the chance to participate in the development of the platform and curriculum content. Many learners come from rural and remote townships such as Winterveld, Atteridgeville, Mamelodi, Hammanskraal, as well as some schools in Pretoria North.

"We started this initiative because we found that many learners in the remote areas of our communities do not think about studying engineering," said Professor Tania Hanekom, EECE Function Head of Undergraduate Studies. "They look at it as a career for learners who come from privileged schools. We created this platform to say, 'No, let us show you that you can not only touch one of these robots – you can also create one!' There is no reason why they cannot study this. We inspire learners to think about engineering as a career because we have a lot of potential in South Africa that we are not using, which is sad. We need all those learners to study towards careers in STEM disciplines and help develop South Africa to its full potential."

Prof Hanekom added that it was concerning that some developed countries have one in 200 or one in 300 engineers in their populations, while South Africa has only one in 3 100. The Tuks Robot School programme engages learners in STEM activities in the hope that the experience will inspire some of them to become future students in the EBIT Faculty.

UP has partnered with non-profit organisation KTG (Keep That Gold Shining), which aims to expose high school learners to introductory robotics and computing principles. KTG works in schools in underprivileged communities and bring learners from these schools to UP at weekends to attend the Tuks Robot School and the Drone and Sensor Schools, which followed after the initial success of the Robot School.

“We select learners who show a keen interest in learning further and place them into a more continuous and more advanced robotics programme,” said Matthew Beekman, KTG Chief Information Officer and UP computer engineering student. “This is where UP’s Robot School, run by Prof Tania Hanekom; UP’s Sensor School, run by Prof Trudi Joubert; and UP’s Drone School, run by myself, come into play. We hope to introduce learners to the possibilities in the industry and to spark interest in as many of them as we can. Within the context of the fourth industrial revolution, information and communications technology and robotics are careers that offer good job security. The skills we share are becoming more of a necessity than a privilege – yet these learners still lack these opportunities.”

Grade 9 learners Lesego Mahladi (15) of Thulaganyo Secondary School in Winterveld and Thato Mathou (14) of Makgetse Secondary School in Hammanskraal said the programme created in them an interest and curiosity about engineering as they learned about coding and robots, as well as the importance of AC and DC motors and how they are used.

“For eight weeks I learned about how engineers create things and I witnessed how coding, architecture and technology create very useful things,” Mathou said. “This programme has definitely made me want to study computer engineering. I cannot wait!”

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Suggested caption:

University of Pretoria students teach high school learners from township and rural schools about robotics as part of the Tuks Robot School programme, which aims to increase the interest in STEM careers among young people.

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ABOUT THE UNIVERSITY OF PRETORIA

The University of Pretoria (UP) is one of the largest contact and residential universities in South Africa, with its administration offices located on the Hatfield Campus, Pretoria. This 115-year-old institution is also the largest producer of research in South Africa.

Spread over seven campuses, it has nine faculties and a business school, the Gordon Institute of Business Science (GIBS). It is the only University in the country with a Faculty of Veterinary Science, ranked top in Africa. Overall has 120 academic departments and 92 centres and institutes, accommodating more than 55 000 students and offering about 1 100 study programmes.

UP is one of the top five universities in South Africa, according to the 2019-2020 rankings by the Centre for World University Rankings. It is ranked among the top 100 universities worldwide in three fields of study (veterinary science, theology, and law) and the top 1% in eight fields of study (agricultural sciences, clinical medicine, engineering, environment/ecology, immunology, microbiology, plant and animal sciences and social sciences).

In May 2020, the annual UK Financial Times Executive Education Rankings again ranked GIBS as the top South African and African business school. The University also has an extensive community engagement programme with approximately 33 000 students involved in community upliftment. Furthermore, UP is building

considerable capacities and strengths for the Fourth Industrial Revolution by preparing students for the world beyond University and offering work-readiness and entrepreneurship training.

For more information, go to www.up.ac.za