

## **SOUTH AFRICA: Five-year engineering degree for Pretoria**

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The University of Pretoria will next year implement an augmented five-year engineering degree that includes compulsory life skills, in an effort to stop students switching from science and technology-related courses to other fields perceived to be simpler - or ultimately dropping out of the university.

Professor Diane Grayson, the university's engineering department academic development manager, said there was a need to bridge the gap between school and higher education to help students cope with their studies. She was addressing some 400 participants at the conference of the academy of sciences for the developing world, TWAS, held in Durban last month.

Several universities in South Africa have academic development strategies for under-prepared students from poorly resourced schools who need intensive training and support to cope with higher education, including 'foundation' years and longer degrees. Government is currently investigating the feasibility of extending three-year degrees to four years at all universities.

Discussing the topic "Teaching Higher Education Science in Africa", Grayson said the core engineering curriculum complemented with additional modules will run concurrently with mainstream degree modules and additional modules to address conceptual understanding, background knowledge, academic and meta cognitive skills.

"We lose many potential science and technology students at the start of higher education. The gap is both academic and psycho-social. University programmes can be very successful in bridging the gap, but they need funding and support," Grayson said.

The foundation course - also known as professional orientation - will be taken in the first year and will include communication, information technology and project skills. It will also encompass foundation modules in physics, chemistry, mathematics, biology, English and conceptual understanding.

The first two years of the core curriculum will be spread over three years and students will join the mainstream degree in their fourth and fifth academic year, she explained.

"The general assumption is that first year students have academic skills, they are computer literate, they can monitor their own learning, can eat properly, are able to manage their money and are resourceful. But it is not always the case," she said.

The programme is designed such that more familiar subjects are encountered first and high support for learning is initially given to students - this intensive support will decrease over time.

"We have to teach the students we have and not those that we wish we would have," Grayson said. This appears to be a direct response to the low quality of students entering universities.

In August, South Africa held pilot national benchmark tests - 'entrance tests' that measure the performance of school-leavers in three key areas and aim to predict whether or not they will have difficulty as they enter university - for a proportion of existing university students.

The test report, produced for the vice-chancellors' association Higher Education South Africa by the National Benchmarks Test Project, claimed that standards were dropping and many students entering university could not read, write or comprehend at higher education level.

At the conference Professor Elly Sabiiti, former dean of agriculture at Makerere University in Uganda, speaking on effective science and technology education in sub-Saharan Africa, called for proper training of teachers to lift the standard of graduates produced.

"TWAS should seriously consider how best to upgrade science and technology teaching particularly in Africa, where we always lag behind," Sabiiti said.