



**merSETA**

MANUFACTURING, ENGINEERING  
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## The merSETA: Press Release

**Attention: Business Editors; Education and Training Editors; Labour Editors**

### **“DibaTwo GT” geared up for the big race**

#### **For immediate release,**

The NMMU Racing Formula Student Project is a multi-disciplinary student-driven initiative run under the auspices of the Department of Mechanical Engineering. The project involves mechanical, electrical and mechatronics engineering students as well as business, marketing, PR, finance and IT students.

NMMU is the first university in Africa to design, build and race a Formula Student vehicle.

In the past five years, the team has successfully designed, built and driven two single-seater racing cars, to compete in the international “Formula Student” competition in Germany. Their first car, “DibaOne”, competed in the 2011 competition in Hockenheim, and the second vehicle, “DibaGT”, powered by an electric motor, competed in Germany recently.

Speaking at the launch, merSETA CEO Dr Raymond Patel said the merSETA is proud to be involved with the NMMU. He said the involvement of merSETA as sponsor of the Chair in Education is a long-term investment.

“We are involved because we need people in our industry who are at the forefront of technology and can become internationally competitive, as companies in our sector (engineering and manufacturing) compete in the international market.

“The merSETA wants to see a positive effect on the success rate of students, thus increasing the pipeline into engineering and manufacturing. Our agreement in particular, speaks to completing the manufacture of an electric Formula Student race



vehicle. To this end, merSETA supports the project with R150 000 for this financial year,” noted Dr Patel.

In 2011, NMMU was the first university in South Africa to compete in this prestigious event, and was able to successfully complete all the static and dynamic events in the competition. NMMU Racing is now in the process of manufacturing and testing the next generation vehicle, which will not only have an improved design, but will also incorporate cutting-edge technologies such as an alternative energy electric powertrain and an active aerodynamic package.

NMMU Racing provides a unique opportunity for students to apply academic knowledge in a practical way. Although the heart of the project is engineering the car, a multi-skilled team is required to run the project effectively and students gain practical experience in a variety of disciplines.

The project is also able to offer P1 and P2 practical modules for students at a university of technology completing their National Diploma in Engineering. Many engineering modules have focused their project requirements on specific technical aspects of the Formula Student vehicle design. This work is building a significant body of knowledge in support of the project, as well as the automotive industry in general.

### **International exposure for students**

The NMMU Racing Formula Student team was formed as a result of the international exchange opportunities provided by the Volkswagen (VW) Chair in Automotive Engineering, where NMMU students have the opportunity to actively participate in University Formula Student Teams. These students are also exposed to the competition by attending with their host teams and, as a result, bring back valuable knowledge and experience to NMMU Racing.

“We have German students joining our team from Ostfalia University, Reutlingen University and Ingolstadt University on six-month exchange programmes. We have also sent students to Germany to attend international training courses such as the ‘Vehicle Dynamics and Data Acquisition Seminar’ by Optimum G held in Koln,” said Mr Trevor Stroud of the NMMU.



The Formula Student project is by nature an international project, and students collaborate online with universities around the world in solving technical problems, before travelling to America, Europe or Australia to compete against each other with their self-built racing cars. NMMU was the first South African university to design, build and race a Formula Student vehicle in this prestigious competition.

### **Collaboration with the Industry**

The Eastern Cape is considered to be a significant automotive industry hub in South Africa and, in establishing the NMMU Racing Formula Student project, the NMMU has been able to build relationships with many significant role players in this industry including Volkswagen South Africa, General Motors South Africa, Continental Tyres and the Nelson Mandela Bay Municipality. The project has also worked with smaller companies on a component and technical level, and through this contact, it has seen students recruited by companies who have been impressed by their unique knowledge and experience.

“We have also seen our partners respond by organising training days for our students, such as Continental’s sponsorship of the 4 Rings Driving Academy for our entire team, as well as Volkswagen Racing’s training in vehicle tuning and preparation for race-day. We therefore consider the NMMU Racing project to be an incubator for automotive engineers in supporting the Eastern Cape and broader South African automotive industry.

“It offers a modern and attractive technical solution particularly adapted to car-sharing or self-service cars, both formulas drawing young people concerned with the development of tomorrow’s car,” elaborated Stroud.

NMMU Racing GreenTech was launched in 2012 to provide the strategic platform through which a completely new racing vehicle could be designed, focusing on alternative energy power sources and efficient aerodynamic design. In January, the NMMU Racing team became the first African team to secure an entry to the electric Formula Student competition in Germany, and has set its sights on achieving a top 10 finish at Hockenheim.

The design of DibaTwo GT commenced shortly after the return from Germany at the end of 2011, and incorporated all the lessons learned on the first car. The development process followed a similar path that a large automotive manufacture



would take. After determining a design strategy and key design objectives, such as reduced weight, lower centre of gravity, shorter wheelbase and improved aerodynamics, components were first engineered in the virtual environment. All the components were modelled in Autodesk Inventor 3D CAD, and engineering simulations done using MSC Adams (motion simulation), Optimum K (suspension kinematic optimisation) and MSC Nastran (Finite Element Analysis), so that the lightest and strongest components could be engineered.

In addition, Star CCM software was used to simulate the airflow over the vehicle so that front and rear wings and an underbody diffuser could be designed to increase down-force.

The most obvious difference between DibaOne and DibaTwo GT is the use of a highly efficient brushless DC motor and lithium polymer batteries to replace the 600cc motor.

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