Industry leader heads Materials Science and Metallurgical Engineering

The Department of Materials Science and Metallurgical Engineering welcomes Prof Roelf Mostert, who was appointed Head of Department with effect from 1 April 2015. Prof Mostert has vast industry experience, which will be utilised to the benefit of the Department, its students and the University as a whole.

His specialisation is in the field of materials integrity and equipment life extension. He has extensive global experience in both facility integrity management (including asset management systems) and the life assessment and extension of oil, gas, power and refinery plants and equipment. He has often provided expert evidence regarding disputes concerning the failure of materials and components – a field often referred to as forensic engineering.

Prof Mostert is an alumnus of the University of Pretoria. He received his BSc Metallurgy and BSc (Hons) Metallurgy degrees from his alma mater in 1979 and 1980 respectively, followed by a master's degree (in 1983) and PhD (in 1989) – also from UP – with a dissertation on research into steel transformation, heat treatment, hardenability and new steel development. He has been registered as a professional engineer with the Engineering Council of South Africa (ECSA) since 1984. He is also a member of the Specialist Technical Committee: Risk-based Inspection Implementation of the South African National Accreditation System.

He launched his career in 1980 at the erstwhile Iscor Limited (which became Mittal Steel South Africa in 2005, now known as ArcelorMittal), where he worked as a principal research officer. Here he was part of the research and development team developing and/or industrialising new steels. In 1988, he joined Denel at the Lyttleton Engineering Works as manager of the Materials Treatment Plant. In 1990, he established a partnership known as Metallurgical Site Support, which specialised in heat treatment and inspection services to the petrochemical and associated industries. The company performed work on all the refineries in South Africa, including those in Sasolburg, Secunda, Durban, Cape Town and Mossel Bay (Mossgas).

In 1996, after Metallurgical Site Support was bought out by the global Cooperheat Group of Companies, he was appointed Director, and later Managing Director, of InnoMet. During this time, he initiated and participated in the acquisition of Metlab 82, a prominent metallurgical laboratory in the East Rand. His period with this company included several highlights, culminating in his involvement in the forensic analysis of the Injaka Bridge Collapse, arguably the most extensive forensic engineering analysis in South African history. This investigation concerned, among others, the quality of welds and the acceptability of weld defects. Finite element analyses and defect acceptability studies were also performed.

His industry experience has made him a recognised expert in industrial integrity engineering.

The expertise he gained at InnoMet led to his appointment in 2012 as chief engineer and Business Unit Manager of Megchem Engineering and Drafting Services (Pty) Ltd. Here he was primarily responsible for developing a business unit focusing on fitness for service and failure, and forensic engineering. He also executed a number of local and international engineering integrity survey projects.

His industry experience has made him a recognised expert in industrial integrity engineering, particularly with regard to the failure of materials and materials degradation, which will be of immeasurable value in the teaching, research and consultation activities of the Department of Materials Science and Metallurgical Engineering.

Prof Mostert has also been very active on the research and innovation front. His research has been cited in a handbook on the bainite transformation in steels, which was published by the Institute of Materials in the United Kingdom.

His research interests include steel degradation mechanisms, fitness for service evaluations, failure analyses, environmentally assisted cracking and alternate dispute resolution. He has delivered papers at a number of conferences both locally and internationally, and has authored and co-authored articles in peer-reviewed journals, as well as numerous technical and policy reports. Furthermore, Prof Mostert has six registered product patents to his credit, as well as the development of a high-ballistic resistance steel plate prototype, produced at two locations in Europe and tested in South Africa.

As Head of Department, Prof Mostert plans to strengthen research in those areas that are already well established in the Department. He also plans to expand research related to globally relevant issues in the mining industry, such as the integrity of materials and components, particularly as these issues relate to the degradation and fracture of materials, as well as their investigation and prevention.

Collaboration with the other departments at the University that form part of the mineral sciences value chain (Geology and Mining Engineering), participation in the activities of the newly established Mining Resilience Research Institute, and fostering cooperation with and developing joint initiatives with international research and academic institutions will ensure that the Department continues to make a meaningful contribution in an industry that plays such an important role in the economic wealth of the country.

Materials Science and Metallurgical Engineering engages in continental collaboration

Dr Bruno Roberts of the Jomo Kenyatta University of Agriculture and Technology in Kenya during a recent exploratory visit to the University of Pretoria.

The University of Pretoria's Department of Materials Science and Metallurgical Engineering has signed a Memorandum of Understanding (MoU) with the Jomo Kenyatta University of Agriculture and Technology (JKUAT) in Kenya, which will result in joint teaching, research and technological development between the two institutions for a period of five years.

JKUAT provides higher learning facilities for university education, participates in the discovery, transmission, preservation and enhancement of knowledge, and stimulates the intellectual participation of students to further the economic, agricultural, professional and cultural development of Kenya. Its mission is to provide accessible, quality university education, training, research and innovation in order to provide leaders in the fields of agriculture, engineering, technology, enterprise development, health and other applied sciences to suit the needs of a dynamic world.

The collaboration entered into between the two institutions is aimed at fostering cooperation and the development of joint initiatives aimed at achieving the following:

- Boosting and enhancing development and industrialisation through research, training, innovation, technological development, and commercialisation and marketing in the areas of engineering, technology and related fields.
- Providing an instrument for establishing various collaborative initiatives for the growth and mutual benefit of the two institutions.
- Enhancing the professional skills and networking of staff of both institutions through training, staff and student interactions, and the exchange of experiences and information.
- Providing a basis for the promotion of materials and metallurgical engineering in Kenya and South Africa.

The institutions will collaborate in terms of the sharing of physical facilities, institutional capacity-building, staff exchange and attachment, the exchange and dissemination of information, and research, innovation and technology development.