

Accessible Excellence and Stature: The Need for Interdisciplinary Studies at the University of Johannesburg

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As well as being an institution that prides itself for its accessible excellence—after only nine years—the University of Johannesburg (UJ) has also established itself as an institution of global excellence and world class stature.

In 2013, QS (Quacquarelli Symonds) World University Rankings ranked UJ among the top 4% of universities in the world, placing UJ in 601-650 out of 16,500 universities worldwide. QS also ranks UJ among the top 1% of universities in the BRICS countries, that is Brazil, Russia, India, China and South Africa, placing 61st among this economic bloc's 6,200 universities. UJ is the first and only African university admitted to the highly respected consortium of 28 research-intensive universities in the world: Universitas 21. All of these accomplishments are important endorsements of the growing international stature of UJ.

In a major shift towards achieving an international reputation for academic and research distinction, UJ intends to invest more than R600 million over the next seven years in six Flagship Research Institutes designed to enrich and deepen its academic profile through research innovation. The strategy aims to transform UJ into a pan-African epicentre of critical intellectual inquiry and scholarship with a particular focus on interdisciplinary studies. This approach is due to decisive action of the institutional leadership from 2013 onwards.

Flagship Institutes

In a global environment that makes increasing demands on the earth's resources for energy, water, food, health, sustainability and industrial mechanisation, the University of Johannesburg aims to influence the international search for solutions through an inter- and multi-disciplinary approach. The flagship programmes have a dedicated focus on postgraduate studies. This includes a cohort of postgraduate students and postdoctoral fellows present in the institutes, visiting professors who can contribute to mentorship and supervision, and a research publication and graduate output plan. One hundred and thirty master's and doctoral students and 80 postdoctoral fellows will be supported over the next five years by the global excellence and stature strategy.

The new multi- and inter-disciplinary flagship programmes support the establishment of new qualifications. These include MPhil degrees in Sustainable Megacities, Neurocognitive Science and in Water Supply, Sanitation and Management. Others include an MSc in Sustainable Mining and Financial Engineering, an MEng in Engineering Management, and an MCom in African Leadership.

We provide some detail of the interdisciplinary programmes, and the research focus below in selected examples of the Research Institutes.

Institute for Earth Sciences

The Earth Sciences Flagship Institute seeks to provide science and engineering solutions for the continuing growth of South Africa's resources industry while at the same time developing benefits to the economy, society and the environment. The programmes are informed by the collective subject of geoscience that is divided into its sub-fields of geology, geophysics and geochemistry. The Institute harnesses the strength of interdisciplinary research that addresses the pressing environmental dilemmas that face South Africa and the world by leveraging research in Physics, Mining Engineering, Geology and Geography.

The institute will assimilate an integrated understanding of the nature and origin of some of the major and minor mineral and fossil energy resources of South Africa and their geometallurgical characteristics. The knowledge produced will be used to explore innovations that will ensure optimum and sustainable extraction of mineral resources.

Institute for Nanotechnology and Water

The establishment of an Institute for Nanotechnology and Water research is characterised as a collaborative effort that creates an intellectual environment that focuses on a multidisciplinary approach. The world-class research in nanotechnology and water purification reflects on the design and creation of functional materials, structure devices and systems and directly controls matter at the nano-level.

Research at the Institute will concentrate on solving some of the long-standing and fundamentally important problems of water purification using progressive methods. The aim of the Institute is to make the research available for publication and teaching purposes and to develop solutions through research for practical application. The goal of the Institute is to broaden the scientific knowledge base of this area of research and support the application of nanotechnology into new areas of purpose.

Institute for Sustainability and Megacities

The critical role of sustainability in Africa is based on the concept of shared values that implement connections between societal and economic progress. The future of Africa can be defined through a framework of sustainability management that initiates opportunity for wealth creation and economic opportunity thus improving the lives of ordinary people on the continent. The Institute aims to integrate various UJ faculties and their global partners in coordinating and implementing sustainability initiatives benefitting Africa's sustainability agenda, specifically in the context of urban development. Research topics range from socio-economic development to architectural, engineering and management applications—all aimed at improving the organisational bottom line by contributing to a greener planet and bettering people's lives.

The Institute for Sustainability and Megacities will be responsible for conducting internationally recognised, academically excellent and problem-oriented interdisciplinary research and teaching on environmental, social and economic aspects of sustainability.

Concluding Comments

The institutional leadership at UJ, has, through its support for the Global Excellence and Stature programme, established three key areas of performance. These are postgraduate studies, research, and innovation. In postgraduate studies, the key indicators include innovative programmes and consistently high postgraduate output, in research the key indicators are research productivity and collaboration, and in innovation these include applying a technology-driven research approach and development. All of the above provide a solid foundation for the establishment of successful interdisciplinary programmes at UJ.