2019 Extended Call for Global Excellence Stature (GES) 4.0 Postgraduate Scholarships

Below are UJ’s Faculties and College’s focus areas in 4IR, which are by no means an exhaustive list of research areas in which applicants should be engaged:

**Faculty of Art, Design & Architecture (FADA):** recognizes that the 4th Industrial Revolution (4IR) represents a new age of creativity, an age that might indeed be considered the Conceptual Age. As machines and artificial intelligence increasingly take over the world of work, the essential human attributes of creativity, empathy, inventiveness, conceptual thinking and adaptability will emerge as skills most needed in the workplace. We invite research that supports our emphasis on creativity, collaboration, communication and critical thinking, and that will enable leading teaching and research in ways in which the creative disciplines can rise dynamically to the challenges of 4IR in creating a sustainable, human-centered future.

**Faculty of Humanities (FH):** is leading Learning Transformation for 4IR, redesigning its curriculum to foreground the critical thinking and problem-solving skills essential to contribute and succeed in the new world of work. It is also innovating on pedagogies to promote adaptability, flexibility, and human engagement skills that will give the students the edge as traditional roles are increasingly automated. The Faculty’s researchers are driving the understanding of the 4th Industrial Revolution beyond its technological component, including the social, communicative, psychological, anthropological, ethical and philosophical aspects, its historical context, and its implications for development, transformation, decolonisation, the growth of inequality, and other stubborn realities that are increasingly concentrated in the sub-Saharan context.

**College of Business Economics (CBE):** The impact of advances in technology on business and economics raises important questions in strategizing the impact of technology to the benefit of South Africa. Who generates and who owns data? To what purpose? How do we improve society’s techno-savvy beyond the level of falling prey to exploitation? Supporting this sense of urgency and agency, UJ College of Business and Economics (CBE) researchers seek ways to use technology to be better informed, to be healthier, to be safer, to behave better, to connect faster and to learn and educate more people than ever before. In so doing, we connect and build on our strengths in accounting, consumer intelligence, information systems, economics and econometrics, public management, governance, as well as tourism and hospitality.

**Faculty of Engineering and the Built Environment (FEBE):** the faculty will support research interests that have the following key words: artificial intelligence; augmented reality; autonomous vehicles; big data; computational intelligence; Cyber-physical systems; deep learning; digital economy; 4IR (4th industrial revolution); fourth industrial revolution; Industry-4.0; internet of things; IOT; machine learning; nanotechnology; predictive maintenance; robotics and virtual reality.

**Faculty of Law (FL):** the faculty’s focus is in Labour Law and Social Protection with a focus on 4IR. This is a pilot aimed at increasing the number of LLM graduates, by Research Dissertation, at the Faculty of Law.
Faculty of Science (FS): the faculty participates in the 4th industrial revolution (4IR) by developing and incorporating relevant key concepts into the teaching curriculum (Undergraduate and Short Learning Programmes), and performing Post Graduate research in 4IR in the biological, chemical, physical, earth and computational sciences. 4IR Research areas in the faculty include but is not limited to the Internet of Things (IoT, communication between intelligent systems of computers, objects and machines that share data), Cloud computing (accessing data and programmes over the internet); open data (data freely available for use without restrictions as in the DNA, protein or metabolome data bases). The development of 3-D printing solutions (e.g. for DNA/protein gel electrophoresis), using block chain to improve data safety and integrity, advances in biological applications of nanotechnology (such as for water purification or drug delivery), genetic engineering and the benefits of gene editing in biotechnology, agriculture and for medical applications, computational biology and algorithmic programming. The fusion of technologies across disciplines forms the basis of the 4th industrial revolution and is therefore a key feature of 4IR projects in the faculty.

Faculty of Education (FE): research in the Faculty of Education is currently focussing on teaching, learning, curriculum and teacher education, which is required to develop 4IR competencies and knowledge in the 21st century. It includes research about education from early childhood continuing to higher education. Studies invoke various perspectives from disciplines, such as, cognitive science, psychology, cultural studies, educational linguistics and technology. Included in this are special needs education, science, engineering and technology education, teaching about and with 4IR tools, and play in learning.

Faculty of Health Science (FHS): intends rolling out “Healthcare in the context of the 4IR” and also the “Bioethics and Technology in Health Care” as potential areas of focus.