

November 2017

### **Funding for a MScEng Study (Chemical Engineering): material and energy balance for *re-imagined* sanitation and waste management in a greenfield integrated urban development**

The Pollution Research Group, School of Engineering (Howard College Campus, University of KwaZulu-Natal, Durban, South Africa), has secured funds for a research and development projects on faecal sludge management, the field testing of reinvented toilet prototypes and resource reuse. The overall goal of the project is to understand the flows of water, nutrients, solid waste and energy through the installation of leading water and waste management systems in a greenfield integrated urban development. The objective is to be completely off the electrical, water and sewage grid through the reuse and up-cycling of co-products. This research will be undertaken in collaboration with the Stockholm Environment Institute. To quantify and integrate the different systems, the Pollution Research Group is recruiting a **Masters student** to undertake a study to quantifying the flows and properties of food, water, energy, greenhouse gases and waste streams that could be found in a reinvented urban development.

This project will focus on:

- Starting with an existing conceptual design and phased construction of a new urban centre which includes shops, offices, hotels, commercial buildings and the full range of residential accommodation
- Making an inventory of possible innovative products, processes and life-style changes and the material and energy flows
- Analysing their interaction under different combinations and interactions with the external communities
- Producing a range of scenarios which seek to minimise the external inputs of water and electricity and the overall environmental impact.

The expected outcome is to generate knowledge that will enable the relevant stakeholders to minimise or plan for sustainable urban living. This will support the overall thrust of the Pollution Research Group in generating knowledge on sustainable water and effluent management.

The **MScEng** research project will require a versatile and self-motivated candidate who ideally has wide knowledge of chemical, biological and engineering systems, an ability to read and transform information from a wide range of fields into quantitative engineering relationships, accurately undertake mass and energy calculations with many recycle loops and have an awareness of human requirements for modern urban living.

The positions will start from January 2018. A total bursary of **R 120 000** will be provided for the **masters** student (over 1 to 2 years) and payment is made on set deliverables being achieved. The project will also cover the cost of a computer, tuition fees and all research operating expenses for conducting field work.

If you are interested in this position, please submit an electronic copy of your transcript, degree certificates and a CV with two referees and a covering letter explaining your motivation to **Ms Susan Mercer** ([merc@ukzn.ac.za](mailto:merc@ukzn.ac.za)). Only shortlisted applicants will be contacted and the deadline for applications is **31<sup>st</sup> December 2017**.

### **Pollution Research Group Discipline of Chemical Engineering, School of Engineering**

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**Founding Campuses:**  Edgewood    Howard College    Medical School    Pietermaritzburg    Westville