

Postgraduate research: Industrial bioprocessing of organic wastes to bio-ethanol

Full-time research-based Master's degree in Chemical Engineering (read more [here](#) about the programme and admission requirements)

Host: Prof. JF Görgens

Commencement: The successful candidate must assume postgraduate work between January and July 2025.

Bursary: Successful candidates will be offered a minimum bursary of ZAR160 000 per year of study, for two years of master's studies.

An opportunity is available for postgraduate research at master's level focused on the assessment and optimization of bioprocesses for the conversion of organic wastes destined for landfill-disposal into bio-ethanol. A number of postgrad positions are available, covering bioprocess optimisation for microbial conversion of preferred organic wastes, and the simulation of alternative process scenarios to identify sustainable investment opportunities.

Organic wastes such as paper and food wastes are highly amenable to bioprocess conversion to bio-ethanol, as a much higher-value product than the conventional composting or anaerobic digestion technologies. However, the technology remains industrially unproven, while substantial variations in the chemical compositions of such organic materials, together with background microbial contamination, offer technical challenges to be solved through bioprocess optimisation. Such process development and optimisation are performed at bench- and pilot-scale, before optimised process technologies are demonstrated under industrial conditions, prior to implementation.

These aforementioned postgraduate projects in this field will be conducted with the Bioresource Engineering group at the Department of Chemical Engineering, Stellenbosch University. This group has long-standing technical expertise in bioconversion of organic wastes to bio-ethanol, with some projects having progressed to industrial demonstration. Both the development of new bioprocessing methods as well as the assessment of available processes for implementation as sustainable biorefinery investment, will be covered in these postgraduate research projects.

Successful postgraduate candidates will be exposed to a network of industry participants, through on-going collaborations of the research group with industry partners, which hold the promise of future career development.

Read more here: <https://chemeng.sun.ac.za/promising-sa-first-solution-to-convert-paper-sludge-food-and-textile-waste-into-bioethanol/>

Requirements

Applicants for the Master's must have good academic record (preferably with a course aggregate of >65%) and hold a bachelor's degree in Chemical Engineering from an accredited tertiary institution. Candidates with BTech, diploma or advanced diploma qualifications will not be considered for these positions. Applicants for PhD studies must hold a Master of Engineering degree in Chemical Engineering from an accredited tertiary institution. Previous experience in bioprocess development, organic waste processing and process simulations will be a definite advantage but is not required. Preference will be given to South African citizens and permanent residents who display academic excellence.

Application

Interested candidates should provide a cover letter, CV, complete academic transcripts, and contact details of at least three academic references. All documents should be merged into a single PDF and attached to the application. Incomplete applications will not be considered. Applications can be sent to Prof. JF Görgens at jgorgens@sun.ac.za.

Stellenbosch University reserves the right not to fill the position.