

Mitigating and sequestering of CO₂ emissions through biochar production

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 can start immediately, but no later than January 2026.

Bursary: Successful candidates will be offered a minimum bursary of ZAR160 000 per year of study.

An opportunity is available for postgraduate research at Master's level focused on the financial and environmental assessment of biochar production from invasive alien plants, as a means to mitigate and sequester CO₂ emissions associated with industrial high-temperature processes. Biochar production from invasive alien plants (IAPs) not only addresses the clearing of IAPs, with multiple environmental/ecological/biodiversity benefits, but also provides thermal energy as co-product for industrial application. The biochar itself finds application as soil amendments in agriculture, with benefits of water-holding capacity and fertilizer effectiveness.

A number of technical process options for biochar production, together with its integration into high-temperature industrial processes, will be investigated through process simulations, financial modelling and assessment of greenhouse gas emissions. The technically and financially most viable approach to mitigating and sequestering CO₂ emissions will thus be identified.

The postgraduate project will be conducted with the Bioresource Engineering group at the Department of Chemical Engineering, Stellenbosch University. This group has long-standing technical expertise in biomass processing, process simulations, and carbon emissions. Successful postgraduate candidates will be exposed to a network of industry participants, through industrial collaborations, which hold the promise of future career development.

Requirements:

Applicants must have a 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. Previous experience in 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.