

DEPARTMENT OF CHEMICAL ENGINEERING

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www.up.ac.za/chemical-engineering

KEY RESEARCH IMPACT

The research focus areas of EBIT's Department of Chemical Engineering are mutually supportive of one another, address the cutting-edge research questions of the day, and emphasise issues related to energy, waste treatment and management, biotechnology/bioprocessing and the environment. The department strives to provide dependable and scientifically proven information in these areas through the conduct of cutting-edge research that is innovative, and with potential to develop feasible, energy-efficient and competitive technologies in the areas. Its graduates and postgraduates are well equipped to address the many challenges and opportunities that are encountered both locally and in the international arena, thereby providing solutions to human and societal problems.



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RESEARCH OPPORTUNITIES

Research chairs and entities

- Rand Water Chair in Water Utilisation Engineering

Exceptional research facilities

Tribology Laboratory

The Tribology Laboratory was established in 1988 with the support of Eskom, Iscor, Sasol and Anglo American to assist in the evaluation and selection of lubricants. The main activity of the laboratory is lubricant performance analysis, and interesting investigations into the tribological behaviour of artificial implants are also being conducted in collaboration with the Department of Mechanical and Aeronautical Engineering.

South African National Research Foundation (NRF)-rated researchers

- Prof WW Focke (B3 NRF-rating)
- Prof W Nicol (B3 NRF-rating)
- Prof EMN Chirwa (C2 NRF-rating)
- Prof MO Daramola (C2 NRF-rating)
- Prof HG Brink (Y2-NRF rating)
- Prof S Tichapondwa (Y2-NRF rating)
- Dr SA Iwarere (Y2-NRF rating)
- Prof FJWJ Labuschagne (C3 NRF-rating)

Research focus areas

- Applied materials, including porous materials and nanomaterials
- Fluoro-materials science and process integration
- Carbon technology and materials
- Clean coal technologies (e.g. Carbon capture storage and utilisation (CCSU))
- Water utilisation engineering
- Waste water treatment (adsorption, membrane, plasma/AOPs, and photocatalysis)
- Waste treatment and valorization (solid waste, agrowaste, industrial, domestic, municipal)
- Tribology and lubricant performance analysis
- Environmental engineering
- Biochemical and bioprocess engineering
- Bioeconomy
- Process modeling, control and optimisation



Faculty of Engineering,
Built Environment and
Information Technology

Fakulteit Ingenieurswese, Bou-omgewing en
Inligtingtegnologie / Lefapha la Boetšenere,
Tikologo ya Kago le Theknolotši ya Tshedimošo

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CAREER PATHWAYS

Qualified chemical engineers can register as professional engineers (Pr. Eng.) after obtaining the required industry exposure. In addition to occupying highly satisfying positions, professional engineers can also undertake consultation work. Honours and master's degree programmes in the Department allow postgraduate students to obtain specialised knowledge in their chosen field, which will benefit them in their careers in industry. For those interested in an academic career, a PhD degree from the Department is an invaluable asset.

TOP 300

**IN THE WORLD FOR
CHEMICAL ENGINEERING**

(2023 QS World University Subject Rankings)



POSTGRADUATE DEGREE PROGRAMMES (click on each programme to learn more)

Chemical engineering and chemical technology

The research focus in this area is on chemical product and process design. Research areas include carbon materials, fluorine polymers and compounds, polymer nanocomposites, surfactants waste valorization, carbon capture storage and utilization and pyrotechnics. Specific projects are determined by the needs of the nuclear, food, energy, chemical and processing industries.

BEngHons Chemical Engineering ■ **BScHons Applied Science Chemical Technology**

MEng Chemical Engineering

Water utilisation

The Department has a long tradition of excellence in education, training and research in the field of water utilisation. The degree programmes offered in water utilisation provide balanced training to students in the fields of water quality management, as well as water and wastewater treatment design, operation and optimisation and using techniques such as adsorption and membrane technology.

BEngHons Water Utilisation Engineering ■ **BScHons Applied Science Water Utilisation**

MEng Water Utilisation Engineering

Environmental engineering and environmental technology

The programmes in this field are formulated to provide human capacity for industry and the public sector and to raise awareness about the finite nature of the assimilative capacity of the environment. Issues relating to clean coal technologies such as carbon capture, storage and utilization (CCSU) and clean energy production (e.g. biofuels) are considered.

BEngHons Environmental Engineering ■ **BScHons Applied Science Environmental Technology**

MEng Environmental Engineering

Process modelling, control and optimisation

The postgraduate programmes in this field equip candidates for a career in the design, implementation and application of basic, as well as advanced control projects in the process industry. They also serve the needs of practitioners involved in the design and implementation of control systems in this environment.

BEngHons Control Engineering ■ **MEng Control Engineering**

Doctoral programmes

PhD Chemical Engineering