DEPARTMENT OF CIVIL ENGINEERING

Learn more:
www.up.ac.za/civil-engineering

KEY RESEARCH IMPACT

EBIT's Department of Civil Engineering is undertaking future-focused research in the state-of-the-art Engineering 4.0 Complex. Its research focus areas impact on the delivery of services to the public through the development of optimal road maintenance and water reticulation networks. This, combined with improved geotechnical analysis techniques, materials improvements and structure analyses, impacts directly on the quality of life of the public.

Research opportunities

- Smart cities and transportation
- Transportation development
- Railway engineering
- Railway safety
- Pipelines
- Hydropower
- Geotechnical centrifuge testing and geotechnical engineering
- Concrete
- Civil infrastructure materials
- Structural testing
- Urban runoff
- Road pavements and materials

RESEARCH PRIDE

Research chairs and entities

- RSR Chair in Railway Safety
- Centre for Transport Development

Exceptional research facilities

- Rail Test Track
- Unsaturated Cyclic Triaxial Laboratory
- Geotechnical Centrifuge
- Concrete Laboratory
- Heavy Test Floor
- Hydraulics Laboratory

Engineering 4.0 Complex

This facility houses several laboratories, and research and training facilities, including a concrete laboratory, a timber laboratory and a training laboratory. It is also the site of SANRAL's National Roads Materials Reference Laboratory, where the independent reference testing of materials for the road construction industry will take place, as well as an accelerated pavement testing track, which entails a dedicated lane on the N4 into Pretoria that can be monitored to study data related to traffic, pavement design and road construction. This will support cost-effective and innovative pavement engineering for Africa's infrastructure development.

South African National Research Foundation (NRF)-rated researchers

- Prof JW Maina (B3 NRF-rating)
- Prof PJ Gräbe (B3 NRF-rating)
- Prof WP Boshoff (C1 NRF-rating)
- Prof EP Kearsley (C1 NRF-rating)
- Prof CJ Venter (C2 NRF-rating)
- Prof SW Jacobsz (C2 NRF-rating)
- Prof G Markou (C3 NRF rating)

Are you ready to start your postgraduate journey?

Click "Apply" to follow the steps in EBIT's Postgraduate Lifecycle or ENQUIRE NOW

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CAREER PATHWAYS

Qualified civil engineers can register as professional engineers (Pr. Eng.) after obtaining the required industry exposure, allowing access to the full scope of civil engineering activities. This may include design, construction, maintenance and management activities. 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. A PhD degree from the Department is an invaluable asset for engineers who would like to become specialists in a technical area, or become involved in academia.

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

Geotechnical engineering

All engineering aspects of soil and rock fall within the discipline of geotechnical engineering. Current research in the discipline focuses on saturated and unsaturated soil behaviour, soil structure interaction problems, in situ testing, and the engineering properties of tailings and other waste. It employs tools such as physical modelling in the geotechnical centrifuge, advanced geotechnical laboratory testing, and numerical and probabilistic analysis.

BEngHons Geotechnical Engineering ■ MEng Geotechnical Engineering

Structural engineering

A wide spectrum of modules are presented in the discipline of structural engineering, including analytical subjects such as structural analysis and structural mechanics, as well as design courses in reinforced concrete, steel and timber. The research in the discipline currently focuses on advanced structural analysis and structural reliability, reinforced concrete, structural steel and structural timber.

BEngHons Structural Engineering ■ MEng Structural Engineering

Transportation engineering

Most of the research conducted in the discipline of transportation engineering falls under the Centre for Transport Development, a collaborative faculty-wide entity coordinating funding and research within this area. The research in the discipline currently focuses on pavement, transportation planning and traffic, as well as railway engineering.

BEngHons Transportation Engineering ■ MEng Transportation Engineering

Water resources engineering

In the discipline of water resources engineering, civil engineers contribute to the sustainable development of safe water supply to all consumers and the protection of this natural resource through an understanding of the natural hydrological cycle, physical principles and the effect of human interference in the design of pipelines, pump stations, open channels and hydraulic structures, and the assessment of the yield from surface water resources.

BEngHons Water Resources Engineering ■ MEng Water Resources Engineering

Construction materials

This discipline is a sub-discipline of Structural Engineering and Pavement Engineering and covers a wide range of construction materials, with a focus on the microscopic behaviour to structural design. Most of the work is done in the field of cement-based materials. At present the research of the discipline is focused on concrete roads, ultra-high performance concrete, fibre reinforced concrete, fresh and green concrete behaviour, and sustainability of construction materials.

Doctoral programmes

PhD Civil Engineering ■ PhD Civil

Curriculum, rules and regulations: www.up.ac.za/yearbooks/home

Click here for Department contact details