



DEPARTMENT OF CIVIL ENGINEERING

www.up.ac.za/civil-engineering

KEY RESEARCH IMPACT

The current research of EBIT's Department of Civil Engineering impacts 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
- **SANRAL and UP Engineering 4.0 facility**
This facility entails an integrated road material reference laboratory, a training laboratory and a research laboratory, combined with a live traffic research facility and an accelerated pavement testing facility.

South African National Research Foundation (NRF)-rated researchers

- Prof WJ vd M Steyn (B3 NRF-rating)
- Prof JW Maina (B3 NRF-rating)
- Prof PJ Gräbe (B3 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)

Join the University of Pretoria's Faculty of Engineering, Built Environment and Information Technology and join a world-class research institution.



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

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 ■ MSc Applied Science Geotechnics

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 ■ MSc Applied Science Structures

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 ■ BScHons Applied Science Transportation Planning

MEng Transportation Engineering ■ MSc Applied Science Transportation Planning

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 ■ BScHons Applied Science Water Resources

MEng Water Resources Engineering ■ MSc Applied Science Water Resources

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

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Faculty of Engineering,
Built Environment and
Information Technology

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Inligtingtegnologie / Lefapha la Boetsenere,
Tikologo ya Kago le Theknolotši ya Tshedimošo

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