

POSTGRADUATE STUDY OPPORTUNITIES

DEPARTMENT OF MATERIALS SCIENCE AND METALLURGICAL ENGINEERING

Learn more:

www.up.ac.za/materials-science-and-metallurgical-engineering



OUR RESEARCH IMPACT

The research of EBIT's Department of Materials Science and Metallurgical Engineering aims to develop optimised and/or novel industrial processes, be it in minerals processing, the extraction and purification of valuable metals or in the manufacture and fabrication of advanced alloys and products. Such novel breakthroughs are frequently aimed at the realities of South African plants and feedstocks, and result, among others, in the production of high-quality products through the innovative use of existing plant or available minerals. With regard to digital (4IR) manufacturing, research carried out in this Department aims to facilitate laser-based and additive manufacturing technologies.

Metallurgical engineers unlock the riches of mineral deposits present in the earth's crust. They are assets to the economy of a country and ensure continuous innovation regarding minerals processing and metals extraction. They also work to assess, extract and recycle materials and component life in demanding process environments.

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Lifecycle or ENQUIRE NOW**

RESEARCH OPPORTUNITIES

RESEARCH CHAIRS AND ENTITIES

- SAIW Centre for Welding Engineers
- Centre for Pyrometallurgy
- Industrial Metals and Minerals Research Institute

EXCEPTIONAL RESEARCH FACILITIES

- Industrial minerals and metals research
- Minerals processing
- Pyrometallurgical modelling
- Pyrometallurgy
- Hydrometallurgy
- Physical metallurgy and corrosion
- Welding engineering

INDUSTRY CONTRIBUTION

The Department's research programme is focused on industrial and commercial problems facing the modern world. It receives generous support from and has many healthy interactions with leading mining and metallurgical companies. One of the cornerstones of Industry 4.0 is advanced manufacturing processes and alloys. The South African government has invested significantly in establishing a local titanium industry, given the abundance of this mineral in South Africa. The Department plays an increasingly important role here with research contributions on titanium extraction from local resources, light metal alloy development, powder metallurgy and 3D printing. The Department is currently the foremost metallurgical engineering department at tertiary level in South Africa.



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**IN THE WORLD FOR
MINERALS AND MINING
ENGINEERING**
(2025 QS World University Subject Rankings)

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CAREER PATHWAYS

Qualified metallurgical engineers can register as professional engineers (Pr. Eng.) after obtaining the required industry exposure. In addition to occupying highly satisfying positions in technology or organisational management, professional metallurgical engineers often undertake consultation and research projects. 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 or research career, a PhD degree from the Department is an invaluable asset.

POSTGRADUATE DEGREE PROGRAMMES



More information on postgraduate studies in the Department of Materials Science and Metallurgical Engineering

Honours and master's programmes

These programmes provide students with in-depth knowledge in selected fields of metallurgical engineering and serve either to enrich the knowledge of the student, or as the fundamental basis of doctoral research.

BEngHons Metallurgical Engineering • BScHons (Applied Science) Metallurgy
MEng Metallurgical Engineering • MSc (Applied Science) Metallurgy

Welding engineering

The honours programmes in welding engineering provide students with the knowledge required to register as an International Welding Engineer or as an International Welding Technologist.

BEngHons Metallurgical Engineering – Welding Engineering
BScHons (Applied Science) Metallurgy – Welding Technology

Doctoral programmes

PhD (Engineering) Metallurgical Engineering