

FROM THE DIRECTOR'S DESK

Welcome to the Future: Embracing 21st Century Mining

Mining is changing in the 21st century and universities must prepare their graduates for it; the impact of this change on jobs and skills is profound, with a cyclical market, increasing costs, mine safety and other issues.

In the 20th century, the hard times were 'weathered' by introducing cost-saving measures and reducing supply. Such strategies normally worked, allowing either mere survival or renewed profitability made possible by the country's above-average resource quality or improved macroeconomics.

However, this approach no longer seems to work – with mineworkers continuing to lose their jobs, despite temporary upswings in production and commodity prices. Apart from these external issues, workers demand human-centred workplaces. The graphic below projects the world of work into the future – using the example of an office worker (an accountant in this case) and a mineworker in the mining production zone.

A human-centered Future World of Work

Can a machine take my job?
What will happen to me?

How much automation is needed?
Are there limits?

Ethics and role of Law and Policy for the Future of Work

Today's human-centered World of Work (Mine Worker)

What do I want in or from my excavation?

Connect me to a need/problem and give me the means to do my work

Create work processes for success so that I can do more, for less

"Put myself in my place of work and wrap a building (or an excavation) around me"

Accountant
(If you don't have one, train)

Mine Workers
(Qualifications/Training)

The lessons arising from this exercise are:

- Qualifications and skills come first, then jobs;
- Work environments must be safe and productive;
- Automation is happening and it is a threat to jobs;
- Ethics, law and policy must balance stakeholder interests; and
- Constant innovation and transformation is essential for a better future of work for mining.



Highlights

This is what makes the WMI different: all our researchers get the opportunity to work on real-life issues

The role of universities is to deliver future-ready graduates to the system, which brings me to this newsletter – focusing on our course programme for next year. 2020 holds some very exciting new developments on the training front for the WMI. We have three new courses, we have revised our popular Mining Best Practice Workshop, we will resume our Master's offerings, and we continue with the successful Community Relations Practice programme.

Together with its centres, the WMI has extensive experience in the development and delivery of training at all levels within the mining industry. The courses and workshops, supported by ongoing research, offer continuous professional development for practitioners from the private, public and non-governmental sectors as well as to government, students and other stakeholders. The training is offered at a range of levels, from NQF 6, which focuses on practitioner training, to the Master's-level NQF 9 courses. Courses are presented by experienced trainers and with expertise from within Wits and our broader network of associates. All programmes and seminars are accredited by Wits; we also offer certificates of competence or attendance.

Empowering Leaders seminar

In August 2019, we offered the Empowering Leaders for 21st Century Mining seminar. This was very well received. With the identified need for leadership and the rapid changes associated with the 21st Century, we have decided to develop this seminar into a fit-for-future, mining-focused leadership development programme. It will consist of four certificate modules, and will expose current and future mining leaders to issues and approaches that need to be adopted for organisational success in the 21st century.

The radical nature of change inherent in the relational, globalised and digital economy requires new ways of leading, and leaders whose qualities are quite different from historical modes. The focus of the course is thus on leadership as opposed to management – co-creating a vision and aligning all stakeholders to work towards its achievement. The module 'Vision in a VUCA World' will be presented in June 2020 and interrogate scenarios of organisational success, relating to the volatile, uncertain, complex and ambiguous (VUCA) world, circular economy and Industry 4.0/5.0.

E-mail: info.wmi@wits.ac.za
Website: <https://www.wits.ac.za/wmi/>
Telephone: +27 11 717 7428

Wits Mining Institute:
Faculty of Engineering and the Built Environment
Chamber of Mines Building (West Campus) CM6
Braamfontein 2001, Johannesburg, South Africa

UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG



WITS MINING INSTITUTE



Attendees at the 2019 Empowering Leaders for 21st Century Mining



Prof Fred Cawood facilitating a tour by course delegates of the DigiMine facility

DigiMine seminar

Our popular Sibanye-Stillwater Digital Mining Laboratory (DigiMine) seminar has been revised and will focus on 'Digital Technology Trends for 21st Century Mining'. We encourage industry professionals to attend and engage with DigiMine researchers and partners on state-of-the-art technological systems for the mining industry. This will be held early in April.

Still within DigiMine, our new 'Numerical Modelling Techniques for Mining' course will be presented in September. Numerical modelling techniques for mining is a 21st century skill that must complement a formal qualification, in this case rock engineering. This advanced tool will equip delegates with the skills to do predictive forecasting of operational and safety scenarios. The course will use two codes – FLAC and 3DEC – developed by Itasca Consulting Inc. in the US. General features of the codes include: large deformation; tracking of sequential rock failure; a library of soil and rock behaviour models; incorporation of realistic geological features; dynamic capability; and coupled groundwater modelling. All Itasca codes use an explicit, dynamic solution scheme, even to simulate quasi-static problems; they also include coupled fluid and thermal modes, and many nonlinear constitutive models.

Community Relations Practice

The Certificate Programme in Community Relations Practice is well established and has been successfully running since 2015 through the Centre for Sustainability in Mining and Industry (CSMI), in partnership with the international consulting company, Synergy Global. The Certificate Programme comprises four courses accredited at NQF Level 6. The aim is to promote competence and professionalism in the management of company-community relationships in the African extractives sector. Currently, there is a cohort of participants who have completed all four Certificate courses. The continued professionalism of this cadre of practitioners will rely on participants being able to advance their studies further, and this is the aim of the new 'Advanced Certificate in Community Relations Practice' course. It allows community relations practitioners to bridge the transition from NQF Level 6 practitioner training to NQF Level 7 training – which prepares participants for acceptance into a Master's programme. This will be presented in September.

MASTER'S PROGRAMME

We are also very excited to be able to resume our Master's programme and will be teaching four courses in 2020 covering our core topics of Sustainable Development, Health and Safety, and Environment. Master's courses are also available to external students as a short course through Wits Enterprise; see <https://wits-enterprise.co.za/short-courses> for more details.

Course dates are included in the table below. For more information, please contact Lileen Lee (Lileen.lee@wits.ac.za or 011 717 7037)

DigiMine	
7 – 9 April 2020	Digital Technology Trends for 21st Century Mining
20 – 22 July 2020	GIS for 21st Century Mining - NEW
31 August – 5 September 2020	Numerical Modelling Techniques for Mining - NEW
Empowering Leaders for 21st Century Mining	
22 – 24 June 2020	Vision in a VUCA World - NEW
26 – 28 August 2020	Self-leadership
Community Relations Practice	
18 – 22 May 2020	Understanding your context, risks, impacts
20 – 24 July 2020	Managing Community Impacts
7 – 9 September 2020	Advanced Certificate - NEW
Master's programme	
24 – 28 February 2020	Sustainable Development in Mining and Industry
11 – 15 May 2020	Safety, Health, Environment and Community Systems
13 – 17 July 2020	Mining and the Environment
3 – 7 August 2020	Risk Management in Mining

Until next time, let us spread the good news that 21st century mining is safe and efficient when we combine a qualification with any relevant 21st century skill. This is exciting!

Professor Fred Cawood
 Frederick.Cawood@wits.ac.za
www.wits.ac.za/wmi/

E-mail: info.wmi@wits.ac.za
 Website: <https://www.wits.ac.za/wmi/>
 Telephone: +27 11 717 7428

Wits Mining Institute:
 Faculty of Engineering and the Built Environment
 Chamber of Mines Building (West Campus) CM6
 Braamfontein 2001, Johannesburg, South Africa

UNIVERSITY OF THE
 WITWATERSRAND,
 JOHANNESBURG



WITS MINING INSTITUTE