AusIMM Courses

# 9 PROFESSIONAL DEVELOPMENT TRENDS IN MINING

## According to twelve mining experts

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2024 EDITION

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# INTRODUCTION

*The resources sector is poised for a transformative year in 2024, and this brings a series of professional development requirements and skill-building opportunities for those working in the industry.*

According to twelve mining experts who contributed to this resource, **professionals will need to respond to shifts in technology, sustainability, public perception, regulatory environments** and more.

Adapting to change is a common thread. Our contributors suggest that **developing both technical and personal skills, as well as embracing the perspectives of a more diverse workforce**, will help professionals excel in their roles and support the mining industry's ongoing success.

AusIMM is **the peak body for the resources sector offering world class professional development.** In 2024, AusIMM will continue to provide an array of **globally-recognised online courses to address knowledge gaps and support professional development.** These courses have been developed by industry experts and incorporate an interactive learning platform, practical case studies and peer-to-peer learning to equip participants with the skills and knowledge they need to thrive.

**See the full AusIMM 2024 Courses Calendar here.**

KEY TREND 1

# Improving public perception of the mining industry

The mining industry will play a crucial role in our energy transition and our collective future. How should leaders be engaging in this conversation?

> **"Mining companies often poorly present the attractions of working in the sector and could do more to raise the industry's image,"** says David Williams.

David Williams FAusIMM is Professor and Director of Geotechnical Engineering Centre at The University of Queensland; Manager, Large Open Pit Project and a facilitator of the AusIMM Tailings Management Professional Certificate.

David Williams

> Melanie McCarthy agrees, **"There is a persistently negative public perception of the mining industry in society. Mining still grapples with an image problem."**

Melanie McCarthy

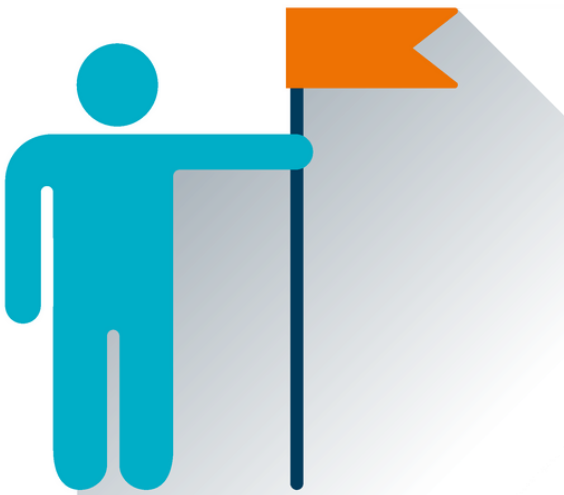
Melanie is the Former General Manager, Mandalay Resources Costerfield Operations, Australia & Principal - Melanie McCarthy Mentor, as well as facilitator of the AusIMM Manager as Leader and Influencer Short Course.

Melanie suggests **leadership training** could form part of the solution:

> **"By empowering industry leaders with effective leadership skills that contribute to the development of positive organisational cultures, we can ensure that people transitioning in and out of the industry carry a positive impression with them."**

**Giving professionals the skills to lead**

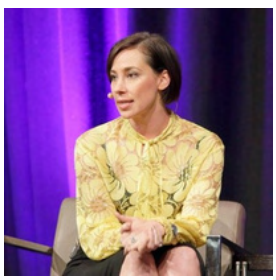
**Promoting a positive organisational culture**



Professionals can create more welcoming workplaces and drive high performing teams by improving their leadership skills.

**“Our industry is dominated by technical and highly skilled operators where hard facts from science and maths, such as qualitative data points, are king. This means the 'softer skills' are often overlooked or undervalued. People and culture related subjects (inclusive leadership, diversity & equity knowledge, values-based influencing, strategic communication and nurturing engaged high performing teams) are the biggest challenge and area of opportunity for professional development,”** says Giulia Savio

Giulia Savio AAusIMM is a Diversity & Inclusion Leader and a facilitator of the AusIMM Diversity & Inclusion Masterclass.



Giulia Savio

This online course is designed to empower participants with the skills and tools to drive positive change in the workplace and broader mining sector.

KEY TREND 2

# Enhancing workforce participation in the resources sector

The resources sector faces a significant challenge in 2024 as labour hire continues to surge, with profound implications for professional development. According to research by McKinsey in 2023, Australia has witnessed a doubling of mining job vacancies since February 2020, and it is projected 24,400 new workers in mining operations and projects will be needed by 2026.

Melanie McCarthy emphasises that the skills gap is **"causing project delays and cost escalations precisely when the industry needs to discover and develop mineral resources to support the energy transition."**

Melanie says to address these challenges,
**"Companies should invest in their employees to create a welcoming and inclusive work environment. This involves nurturing leadership that is culturally aware and values workplace respect, flexibility and Indigenous opportunities. Any shifts away from traditional mining practices need to be fair, inclusive, and supportive of affected workers and communities."**

John Jessop also suggests the resources sector should focus on making work environments accommodating for a range of individuals.

**“Designing work for individuals with different physical capacities than what was typical in the past is essential for safety and efficiency,’** John says.

John Jessop is Managing Director - Think Advisory Pty Ltd, BSC (Geophysics) and a facilitator of the AusIMM Metal Accounting Professional Certificate.

John Jessop

Bruce Harvey emphasises that with the increase in sector roles, there will be a vital need for the development of technical skill to mitigate risk:

**“There are many people moving up through the ranks who presently cannot do the work that is required.”**

Bruce Harvey FAusIMM(CP) is Geologist, Social Performance Professional and a facilitator of the AusIMM Operationalising ESG Short Course.

Bruce Harvey

**“Less value is being placed on technical professional development,”** says Peter Fairfield.

“So this is falling by the wayside. The issues are exacerbated by not capturing good practice due to loss of corporate knowledge and not valuing that knowledge in the first place.”

Peter Fairfield FAusIMM(CP) is Principal Consultant, Miner Insight Pty Ltd and a facilitator of the AusIMM Study Processes for Resource Projects Short Course.

Peter Fairfield


**“There is a huge opportunity for formal and informal knowledge transfer through mentoring. We need to make time and space for creating networks that lead to professional development. AusIMM courses are a great opportunity for this.”**

KEY TREND 3

# Traceability and responsible mining

Growing awareness of environmental and ethical concerns has seen consumer-facing organisations increase their demand for end-to-end mineral traceability, in turn placing pressure on mining companies to ensure transparency.

**“Traceability”** refers to tracking of minerals at all points of the trading chain from their mine of origin to their point of export, according to the Organisation for Economic Co-operation and Development (OECD) in their guideline ‘Due Diligence Guidance: towards conflict-free mineral supply chains’.Traceability is swiftly transitioning from a **"nice-to-have"** feature to a **"must-have"** capability.

**“The challenge lies in implementing advanced tracking technologies, ensuring compliance with evolving regulations, and fostering collaboration among industry stakeholders to establish standardised traceability systems,”** says John Jessop

When it comes to responsible mining, one of the highest profile challenges relates to tailings management. These challenges stem from a variety of factors, including environmental concerns, safety issues, and increased scrutiny from regulatory bodies and the public.

In response to these challenges, Peter Chapman says,

**“The industry is increasingly recognising the need to establish and adhere to comprehensive global frameworks that encompass best practices, safety protocols, and environmental sustainability, ensuring responsible and accountable tailings management practices across the board.”**

Peter Chapman FAusIMM is Principal Tailings Engineer, WSP and a facilitator of the AusIMM Tailings Management Professional Certificate

Peter Chapman

The move towards these global frameworks represents a proactive and collective effort to address the complex and evolving issues facing the tailings industry while fostering greater transparency and trust within the sector.

KEY TREND 4

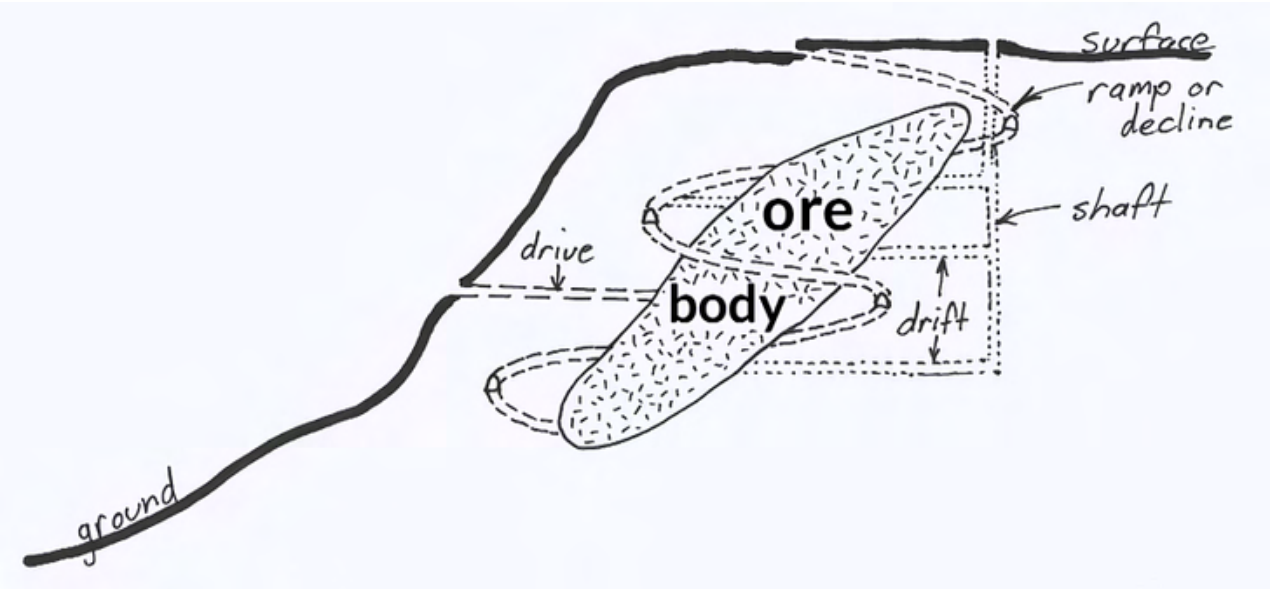
# Maximising the orebody

Another skill in high demand in 2024 will be professionals with the knowledge and ability to optimise the potential of the orebody while minimising environmental impact.

> **"The essence of this challenge revolves around the responsible and sustainable utilisation of finite resources, particularly in light of the extensive land disturbance that resource extraction often entails,"** says John Jessop.

John expands further, **"The challenge necessitates a shift in mindset toward holistic resource management, where professionals are not only focused on maximising resource recovery but also minimising environmental degradation and ecosystem disruption."**

In terms of professional development, this challenge encourages the industry to foster a new generation of resource professionals well-versed in sustainable resource management, ethical mining practices, and environmental stewardship.

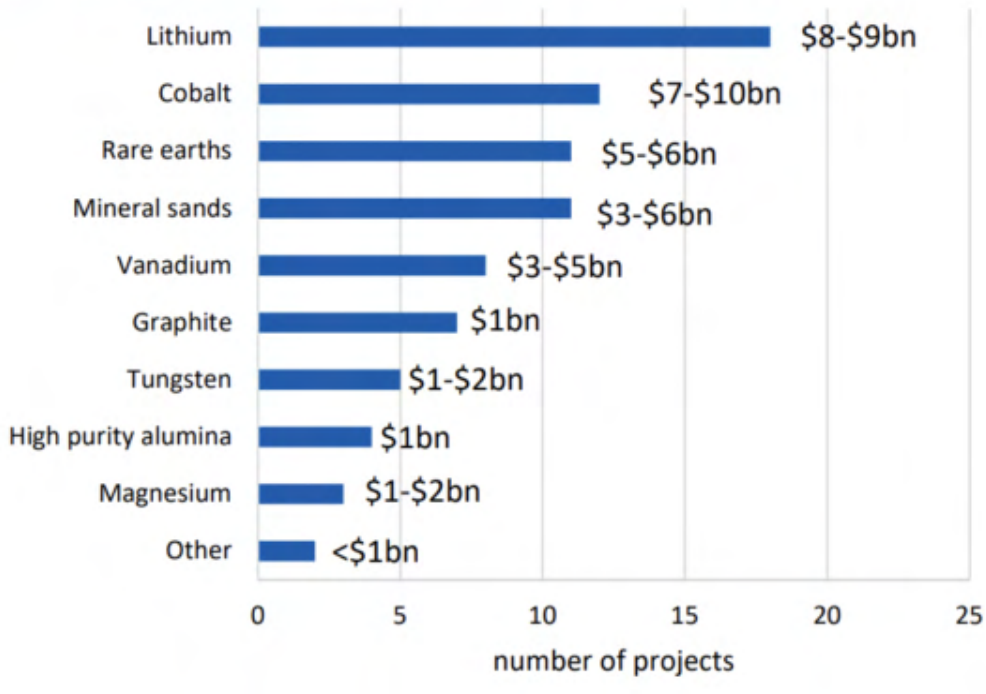


KEY TREND 5

# Supporting the critical minerals opportunity through best practice reporting

Critical minerals are essential components in various modern technologies, including renewable energy systems, electric vehicles, and electronics. As the world transitions towards cleaner energy sources, the demand for these minerals has surged, with the demand for other metals to support the transition to green energy growing in parallel.

Australia is a key player in the critical minerals landscape. According to the Australian Government's Critical Minerals Strategy 2023-2030, the country is rich in resources such as lithium, cobalt, rare earth elements, and other minerals crucial for the development of lithium-ion and vanadium flow batteries, LED lighting, advanced medical equipment and more. This has positioned Australia as a focal point for governments aiming to secure access to these critical minerals.




Peacock, B. (2022) Hydrogen dominates Australia's energy value future as earnings from Critical Minerals Surge, resources report finds, pv magazine Australia.

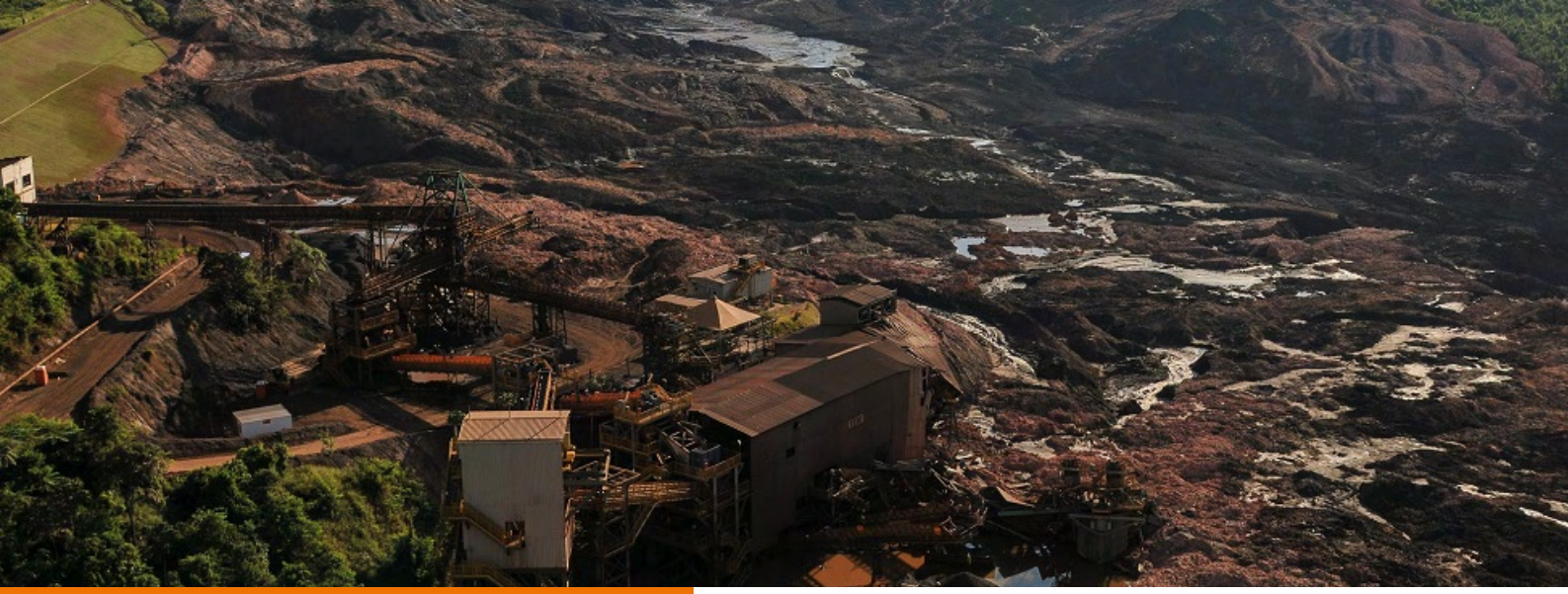
In response to the growing significance of critical minerals, there will be increased responsibility for professionals to be at the forefront of best practice in public reporting standards. The VALMIN (mineral asset evaluation and valuation reporting) and JORC (exploration, mineral resources and ore reserves reporting) Codes serve as best-practice industry guidelines for the resources sector.

**“There has been increasing interest in, and demand for, critical minerals to support the energy transition. Ensuring that our public reporting relating to these ‘new’ commodities is high quality and can be relied on by investors is a key issue for those developing and practising under the VALMIN and JORC Codes.”** says Deborah Lord.

Deborah Lord MAusIMM is Chair of the VALMIN Committee; Principal, Valuation and Resource Management and a facilitator of the AusIMM VALMIN Code Reporting

Deborah Lord

As the energy transition gains momentum, ensuring the credibility and transparency of public reports becomes paramount for fostering investor confidence and facilitating the sustainable development of critical mineral projects.



KEY TREND 6

# Improved tailings and associated water management

**“The catastrophic Brumadinho tailings dam failure in January 2019, which caused 270 fatalities, raised tailings dam stability to the most pressing engineering issue for the minerals industry globally”**, says Professor David Williams, Director of Geotechnical Engineering Centre at The University of Queensland.

The response to this failure was the drafting of the Global Industry Standard on Tailings Management (GISTM), which was launched in August 2020. Professor Williams says that the aspirational goal of the GISTM is to have zero harm to people and the environment by raising tailings facility design, construction, operation, and closure to meet the requirements of closure from the outset.

To achieve this, the GISTM recommends design for 1 in 10,000-year flood and earthquake loadings. This prompts the separation of safe tailings containment from storage, with maximum dewatering of the tailings to be stored to minimise the height and hence the cost of the stable containment, achieving optimal tailings and associated water management.

The **24 leading mining companies** who are Members of the International Council of Mining and Minerals (ICMM) have adopted the **GISTM**, as have many other mining companies. Among the 15 principles and 77 requirements of the GISTM is improved tailings facility governance through the establishment of company Accountable Executives and Responsible Tailings Facility Engineers, and Engineers and Designers of Record and Independent Tailings Review Boards or Senior Reviewers. The establishment of these roles has highlighted a severe shortage of qualified and experienced tailings professionals to fill them.

Professional development needs to focus on providing **current** and **future** tailings practitioners with an awareness of the key issues and learnings of:

- Tailings and associated water management
- Geotechnical engineering
- Geochemistry and water balance
- Governance
- Closure
- Social responsibility

KEY TREND 7

# Treating mine closure as a process

Mine closure encompasses a complex and multifaceted process that requires the integration of diverse skills and expertise.

**"Closure is talked about like a profession rather than the full multidisciplinary process that it is,"** says Kim Ferguson.

Kim Ferguson

Kim Ferguson FAusIMM is Director Mine Closure, WSP and a facilitator of the AusIMM Integrated Mine Closure, Professional Certifitcate

To address this challenge, Kim suggests, "Professional development should focus on nurturing people who possess both technical (hard) skills relevant to specific aspects of closure and professional (soft) skills such as strategic thinking, collaboration, adaptability, communication, and problem-solving.

**"The objective is to cultivate an integrated workforce capable of orchestrating successful closures by effectively balancing the diverse risks (threats and opportunities), objectives, and perceptions of internal and external stakeholders, thereby ensuring responsible and sustainable mine closure."**

Dr Carl Grant says that for closure to become integrated in life of mine planning it requires “multi-disciplinary input and ownership from all functions on an operating mine including short/medium/long-term planning, engineering, projects, technical services, external affairs, social, governance, finance, health and safety, legal and HR, in addition to the traditional ownership by the environment or sustainability disciplines.”

**“The challenge is that many personnel in disciplines historically focussed on operations do not understand what their role and associated responsibilities are in integrated closure. The first step to addressing this is awareness that they have a role to play. The next is to clearly define what that role is, and how they can manage closure risk and identify opportunities throughout the mining lifecycle to realise value and facilitate effective social transition,”** says Carl.

Dr Carl Grant MAusIMM is Director and Principal Closure/Rehabilitation, Unearthed Environmental Services Pty Ltd and a facilitator of the AusIMM Integrated Mine Closure, Professional Certificate.

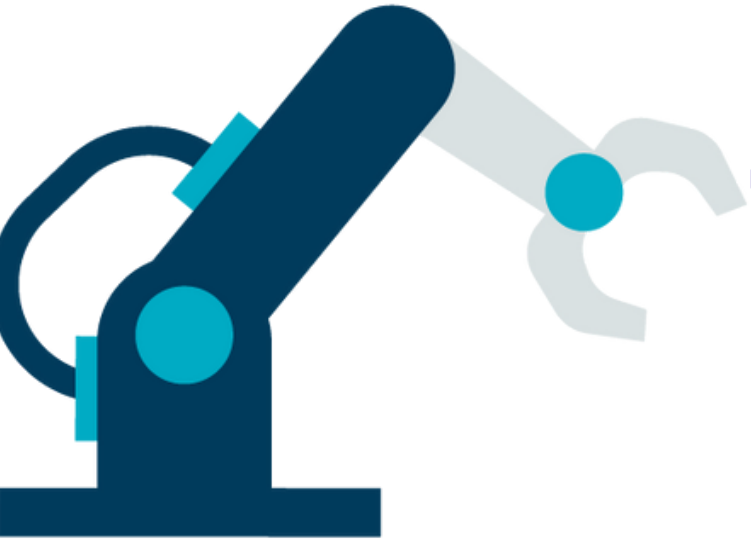
Dr Carl Grant

KEY TREND 8

# The use of AI and automation

The accelerated adoption of AI and automation in the mining industry presents significant opportunities. AI can improve safety by analysing data and attempting to predict accidents, equipment failure and injury; intelligent systems can decrease negative environmental impacts and save companies time and money when it comes to locating and extracting minerals. While many experts acknowledge the inevitability of this transition, they say there are hurdles in integrating these technologies into their existing practices.

The proprietary nature of AI and automation knowledge further compounds the issue, as industry professionals grapple with limited access to critical information. Bridging this knowledge gap and making AI and automation skills accessible to a broader workforce is crucial to ensure these innovations become mainstream within the sector.



**“Automation and AI is coming, but the way we integrate it into our thinking, our outputs and work procedures is not clear. Those that have the knowledge are not disseminating it through the industry because they see it as their competitive advantage. Until we can start showing people what is involved and how we include it in our processes and mine plans, then it will be hard for it to become part of mainstream mine planning,”** says Glen Williamson.

Glen Williamson FAusIMM is Principal Mining Engineer, AMC Consultants and a facilitator of the AusIMM JORC Code Reporting.

Glen Williamson

**“There are new and emerging vocations and areas of professional practice in our industry (e.g. data scientist, geospatial professional, remote sensing specialist, robotics engineer, risk analyst) that need to be recognised.”** says Bruce Harvey.

KEY TREND 9

# Responding to changing reporting environments

The regulatory environment of the mining industry is ever-changing. The challenge is for resources professionals to be able to keep up with the changes and adhere to new codes and standards of practice.

“In my area of expertise, the biggest issue or challenge for professional development relates to the VALMIN and JORC Codes,” says Deborah Lord, who cites two new areas that are influencing the way reporting must occur.

**“With changing regulations and reporting requirements, particularly related to ESG, I believe one of the biggest challenges is how these aspects will be incorporated in the estimation, assessment and valuation of exploration, mineral resources and ore reserves going forward.”**

**“While many professionals in the resources sector are familiar with technical inputs to resource and reserve assessment, fewer are well versed in how to deal with ESG elements. We will all need to come up to speed with these quickly as societal attitudes will demand that we do.”**

For professionals to deliver high-quality reports, there needs to be rigour around the project studies that underpin them.

**“The reliability and credibility of mining project studies is a critical yet often neglected concern,”** says Adrian Pratt.

Adrian Pratt

Adrian Pratt FAusIMM(CP) is the Principal at Adrian Pratt & Associates Pty Ltd and a facilitator of the AusIMM Cost Estimation for the Resources Industry Short course.

**“AusIMM, the peak body for all people working in the resources industry, is improving industry performance in this area by offering coursess on the process of completing studies, and cost estimation.“**

**“However, it remains a challenge; a part of which is leaders are not consistently prioritising appropriate methodologies when completing studies."**

"Super interactive, super easy to follow."

ELLEN POLLOCK
People and Culture Officer, Micromine

"What I enjoyed most was the direct interaction with the facilitators."

JAMES FRANCIS NATUKUNDA
Geologist, Ministry of Energy and Mineral Development, Uganda

# 2024 Online Courses Calendar

## JANUARY

## FEBRUARY

**JORC Code Reporting** — 40
PROFESSIONAL CERTIFICATE

**Operationalising ESG** — 20
MINE OPERATIONS SHORT COURSE

**Enabling Optimal Performance** — 20
MINE OPERATIONS SHORT COURSE

**Manager as Leader and Influencer** — 20
MINE OPERATIONS SHORT COURSE

## MARCH

**Metal Accounting** — 40
PROFESSIONAL CERTIFICATE

**Cost Estimation for the Resources Industry** — 20
SHORT COURSE

**Integrated Mine Closure** — 40
PROFESSIONAL CERTIFICATE

**Study Processes for Resource Projects** — 20
SHORT COURSE

## APRIL

**Strategy and Governance** — 20
MINE OPERATIONS SHORT COURSE

**Tailings Management** — 40
PROFESSIONAL CERTIFICATE

**Geophysics for Mining Professionals** — 40
PROFESSIONAL CERTIFICATE

**ESG and Social Responsibility** — 40
PROFESSIONAL CERTIFICATE

## MAY

**Business Optimisation, Performance and Improvement** — 20
MINE OPERATIONS SHORT COURSE

**The Mining System** — 20
MINE OPERATIONS SHORT COURSE

## JUNE

**JORC Code Reporting** — 40
PROFESSIONAL CERTIFICATE

## JULY

**VALMIN Code Reporting** — 20
SHORT COURSE

*"A great course for anyone working closely with an operational team. The mining operations system's principles and operational reporting sections were a real highlight."*

– ADAM BENNETT | PARTICIPANT OF THE MINING SYSTEM MINE OPERATIONS SHORT COURSE

AusIMM Courses

"The trainers and the delivery of the course was amazing."

NILOOFAR KARIMIAN
Postdoctoral Research Fellow, CSIRO

"I apply learnings from the course to my day-to-day professional life."

ANIL MENARIA
Senior Advisor, Strategic Production Planning, RioTinto

KEY: PROFESSIONAL CERTIFICATE | SHORT COURSE | SELF-PACED | 00 PD HOURS

## AUGUST

**Operationalising ESG** — 20
MINE OPERATIONS SHORT COURSE

**Enabling Optimal Performance** — 20
MINE OPERATIONS SHORT COURSE

**Manager as Leader and Influencer** — 20
MINE OPERATIONS SHORT COURSE

## SEPTEMBER

**Cost Estimation for the Resources Industry** — 20
SHORT COURSE

**Integrated Mine Closure** — 40
PROFESSIONAL CERTIFICATE

**Metal Accounting** — 40
PROFESSIONAL CERTIFICATE

**Study Processes for Resource Projects** — 20
SHORT COURSE

**Tailings Management** — 40
PROFESSIONAL CERTIFICATE

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## OCTOBER

**JORC Code Reporting** — 40
PROFESSIONAL CERTIFICATE

**ESG and Social Responsibility** — 40
PROFESSIONAL CERTIFICATE

**Business Optimisation, Performance and Improvement** — 20
MINE OPERATIONS SHORT COURSE

**Strategy and Governance** — 20
MINE OPERATIONS SHORT COURSE

## NOVEMBER

**The Mining System** — 20
MINE OPERATIONS SHORT COURSE

## DECEMBER

## SELF-PACED COURSES (YEAR ROUND)

**Breaking the Surface:** AN INTRODUCTION TO THE RESOURCES SECTOR

**Establishing a New Minerals Consultancy** — 5
MINERAL CONSULTANTS FUNDAMENTALS 1

**Planning Your Consultancy Business** — 5
MINERAL CONSULTANTS FUNDAMENTALS 2

**Effective Client Relationships** — 5
MINERAL CONSULTANTS FUNDAMENTALS 3

**Delivering to Client Expectations** — 5
MINERAL CONSULTANTS FUNDAMENTALS 4

**Managing Risk as a Consultant** — 5
MINERAL CONSULTANTS FUNDAMENTALS 5

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David Williams


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Peter Fairfield

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