

EXPLORATION, MINING & PROCESSING FUNDAMENTALS

Live Online Training Course: The Essential Techno-Commercial Introduction to Mining

Build your knowledge & confidence in the mining business lifecycle & its technical jargon by examining its technical & commercial components spanning exploration, geology, mining methods, production & processing.

November

Course Parts will commence at **09:00** and end at **13:00** (Perth Time). There will be short breaks during each course Part.

Part 1: **16th November**

Part 2: **17th November**

Part 3: **23rd November**

Part 4: **24th November**

4 Part
Series



**Our Expert
Course
Instructor**



Richard Durham

Richard has over 30 years' experience in the mining industry and holds a PhD and a degree in Mining.

Key Learning Objectives

- ▶ Understand the make-up of the Australian mining industry
- ▶ Discover mine exploration techniques
- ▶ Understand mine geology and ore body modelling
- ▶ Analyse resource/reserve estimation and statutory requirements: JORC
- ▶ Learn about mine planning and mine start-ups
- ▶ Analyse mining methods, processes and practices –surface and underground
- ▶ Understand mine closures, environmental, safety and legal considerations
- ▶ Comprehend corporate governance, industry challenges and the future

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ABOUT THE COURSE

This course will provide a new or relatively new entrant into the mining industry with a clear understanding of the fundamentals, workings and technical components of mining in general, and its application in the Australian and global industry.

Participants will learn about the technical aspects of mining ranging from exploration methods, geology, resource estimation, surface mining and underground mining to mine planning, mining methods and mine closures.

You will gain a sound understanding for the terminology used within the industry and gain knowledge of the motivation and factors that influence the technical and broader industry personnel whom they interact with on a day-to-day basis.

For those who need to become experts in the mining industry, this course will provide a fundamental background and starting point, and improve communication and negotiation with peers and stakeholders.

WHO WILL BENEFIT

This course has a techno-commercial focus for technical and business oriented professionals who are either new to the mining industry or experienced in one part but could benefit from a wider perspective.

- New employees who need a good basic understanding/overview.
- Mid-level employees who have recently transferred within the industry.
- Bankers, lawyers, government, consultants, directors and other industry participants.

EXPERT COURSE INSTRUCTOR



Richard Durham

Richard has over 31 years experience in the mining industry and holds a PhD and a degree in Mining from the Royal School of Mines, Imperial College, London.

He worked for several years for Datamine, initially as a consultant and then as general manager, helping produce advanced modules such as stratigraphical unfolding and mining zone modelling. Richard's experience also includes working for small technical consultancies and as an individual consultant. In those roles he has been involved in many mining projects, and in commodities including gold, nickel, iron, mineral sands, lead, zinc and coal.

Richard's field of expertise is in the practical application of technical software and hardware to mining, particularly in mine design, resource and reserve modelling, geostatistics and grade control.

WHAT OUR CLIENTS SAY

"This course was beyond useful - Richard was such a great presenter, and the content while giving an overview, included enough detail to get a really good understanding of what was being discussed."

Finance Business Partner, **Round Oak Minerals Pty Limited**

"Topics covered were extremely relevant and covered in sufficient detail to be of benefit. Material (including CD) is a useful reference to take away. The use of videos are very instructive."

Finance Manager, **BHP**

"The course was a great way to get a broad understanding of the mining industry and the work involved in the mining process. Helped to know just how many aspects there are. The instructor was very knowledgeable, easy to listen to and used relevant example to help us gain an understanding."

Junior Geologist, **Ministry of Economic Development**

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Course Outline

Overview of the Australian mining industry

- Overview of the location of different mineral resources in Australia and their general mining methods
- The importance of mining to Australia and its financial impact
- Roles, responsibilities and relationships of technical staff including geologists, engineers, metallurgists, environmental etc
- The who and where of Australian mining and exploration companies
- General mining industry terminology and definitions
- The different stages of a mining project from discovery to completion

Geology

- What's a mineral?
- What's a rock?
- Examining the three main types of rocks and their creation
- Exploration techniques
- Mineral exploration –how to select where to explore based on geological and non-geological factors

Orebody modelling

- Overview of orebody modelling, its role in mining –why it's done and what it achieves
- Limitations of modelling
- Grade estimation
- Geostatistics
- Conditional simulation

Resource/reserve estimation and statutory requirements

- Reporting resources and reserves to the Stock Exchange
- The Joint Ore Reserve Committee (JORC)

Activity - Defining a mineral resource

Surface mining –open put mining

- Overview of open pit mining. Why open pit?
- Examining the different surface mining equipment and their uses, including:
 - Trucks and shovels
 - Excavators
 - Front end loaders
 - Surface miners
 - Trolley assist
 - Drilling and blasting
- Case examples of open pit operations

Activity - Productivity calculation of an open pit mine

Examining the open pit mining cycle

- Grade control
- The role of geologists in production

Other surface mining methods

- Strip mining
- Bucket wheel excavators
- Draglines
- Scrapers
- Dredging
- Hydraulic mining
- Materials handling on an open pit mine –conveyors, trains
- Mining method selection –how are different methods selected?
- Case examples of different mining methods
- Environmental issues associated with surface mining

Underground mining

- Examining underground mining methods and layouts
- Cut and fill
- Room and pillar
- Open stopping
- Caving
- Longwall
- Backfill
- Recovery
- Dilution
- Mining method selection
- Underground mine development
- Stope blasting
- Remote controlled equipment
- Development blasting
- Ventilation
- Dewatering
- Materials handling:
- Ore passes
- Ground and strata control
- Overview of underground equipment
- Jumbos
- Raise-borers
- Case examples of different mining methods

Activity - Choosing an underground mining method

Mine planning

- Explanation of mine planning and its role in the mining process
- What is ore and what is waste – cutoff grades
- The importance of selectivity
- Pit optimisation:
- Lerchs-Grossman

- Whittle
- Scheduling –selecting the best order in which to extract a deposit
- Measuring the quality of the rock
- Shafts vs. declines
- Stockpiling, blending and storage of minerals
- Contractor vs. owner operator –how and why do you make the decision?
- Infrastructure –FIFO
- Mineral resources vs. ore reserves
- How much to spend on exploration

Activity - Cutoff and scheduling

Mineral processing

- What is mineral processing? What is its role in the mining process?
- Comminution:
- Overview of a comminution circuit
- Crushing, grinding –exposing the mineral
- Mine to mill optimisation
- Why are different ores ground in different ways?
- Examining comminution equipment:
 - Jaw crushers
 - Gyratory crushers
 - Rod mills
 - Wet vs. dry grinding
 - Cone crushers
 - Ball mills
 - SAG and AG mills
 - Bond Work Index

Mineral processing continued

- Examination of separation methods to extract minerals:
 - Gravity concentrators
 - Spiral concentrators
 - Cyclones
 - Flotation
 - Hydro-metallurgy
 - Pyro-Metallurgy
 - Bio-leaching
 - Tailings storage facilities:
- Discharge methods
- Upstream, downstream and centreline construction
- Daywall dam
- Case examples of different processing circuits

Industry challenges and the future

- The image of mining
- Sustainability
- Legislation
- Shortage of trade and technical staff
- Remote controlled equipment
- Undersea mining
- Continuous mining equipment

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Easy Ways to Register

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Exploration, Mining & Processing Fundamentals

Course Code	Location	Course Parts	Month	Standard Price	4+ Dels Discount
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Speak with **Anton Long** or **Holly Baldwin** on **+61 (02) 9080 4455** to discuss your customised learning solution, or email training@informa.com.au