Circular Economy in Mining Training Course

Professional Development Training Course Outline

Category	General Training	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

The global mining and metals sector has arrived at a critical operational turning point, driven by declining ore grades, compounding environmental liabilities, and volatile geopolitical supply chains. Circular Economy in Mining Training Course provides an advanced blueprint for translating sustainability mandates into measurable, cross-functional profitability. By reframing extractive operations through the lens of a circular economy, this training empowers industry practitioners to shift from volume-driven depletion to value-driven resource stewardship. Participants will discover how to transform systemic overhead such as mine tailings, waste rock, and metallurgical slags into highly lucrative, secondary asset streams.

This course delivers deep technical insights into advanced, sensor-based sorting assisted by deep learning, smart water reclamation networks, and the fast-growing market of urban mining. Beyond localized mine-site strategies, the curriculum addresses broad value-chain orchestration. It provides leaders with the tools needed to establish closed-loop partnerships with downstream manufacturing sectors, deploy product-as-a-service (PaaS) procurement models, and successfully design post-mining landscapes for regenerative use. Ultimately, this program equips participants with the strategic engineering and financial frameworks required to de-risk operations, lower scope-1, -2, and -3 carbon emissions, and establish a long-term, competitive advantage in a resource-constrained global economy.

Programme Curriculum

Circular Economy in Mining Training Course

Introduction

The global mining and metals sector has arrived at a critical operational turning point, driven by declining ore grades, compounding environmental liabilities, and volatile geopolitical supply chains. Circular Economy in Mining Training Course provides an advanced blueprint for translating sustainability mandates into measurable, cross-functional profitability. By reframing extractive operations through the lens of a circular economy, this

training empowers industry practitioners to shift from volume-driven depletion to value-driven resource stewardship. Participants will discover how to transform systemic overhead such as mine tailings, waste rock, and metallurgical slags into highly lucrative, secondary asset streams.

This course delivers deep technical insights into advanced, sensor-based sorting assisted by deep learning, smart water reclamation networks, and the fast-growing market of urban mining. Beyond localized mine-site strategies, the curriculum addresses broad value-chain orchestration. It provides leaders with the tools needed to establish closed-loop partnerships with downstream manufacturing sectors, deploy product-as-a-service (PaaS) procurement models, and successfully design post-mining landscapes for regenerative use. Ultimately, this program equips participants with the strategic engineering and financial frameworks required to de-risk operations, lower scope-1, -2, and -3 carbon emissions, and establish a long-term, competitive advantage in a resource-constrained global economy.

Course Duration

5 Days

Course Objectives

1. Deconstruct the Linear-to-Circular Paradigm Shift.
2. Capitalize on Tailings Reprocessing and Metal Recovery
3. Architect Industrial Symbiosis Systems
4. Deploy AI-Driven Sensor-Based Sorting Technologies
5. Optimize Closed-Loop Mine Water Management
6. Master Urban Mining and Secondary Resource Sourcing
7. Formulate Circular Procurement and PaaS Frameworks
8. Quantify and Report Circular Economy Performance Indicators (CEPI
9. Negotiate Strategic Downstream Closed-Loop Partnerships.
10. Decarbonize Mining Value Chains via Renewable Integration
11. Redesign Post-Mining Landscapes for Regenerative Use
12. Mitigate Geopolitical Supply Risks for Critical Minerals
13. Lead Agile Organizational Change and Circular Innovation

Target Audience

- Chief Sustainability Officers (CSOs) & ESG Directors.
- Operations Directors & Mine General Managers.
- Metallurgical Engineers & Process Optimization Specialists.
- Supply Chain, Procurement, & Logistics Managers.
- Corporate Strategy & Business Development Executives.
- Environmental Policy Makers & Mining Regulators.
- Investment Analysts & Green Fund Managers

Course Modules

Module 1: Foundations of Circular Mining and Resource Security

- Economic Transition
- Macro Trends.
- The Circular Extractives Framework.
- Regulatory Landscapes.

- Value Multipliers.
- *Case Study:* Analysis of the International Council on Mining and Metals (ICMM) circular economy guidelines and their application across global multi-commodity operations.

Module 2: Waste Valorization: Tailings Reprocessing and Co-Products

- Tailings Re-Mining
- Industrial Symbiosis
- Multi-Mineral Maximization.
- Zero Waste-to-Landfill
- Geotechnical Risk Mitigation
- *Case Study:* Reviewing Newmont and BHP's large-scale projects that repurpose copper and gold tailings into commercial construction materials and alternative aggregates.

Module 3: Next-Generation Process Design and Smart Automation

- AI Sensor-Based Sorting.
- Energy-Efficient Commenution
- Closed-Loop Water Networks.
- Biotechnology in Processing.
- Digital Twins for Optimization.
- *Case Study:* Examining Anglo American's "FutureSmart Mining" program, specifically looking at how coarse particle recovery and AI sorting systems reduced energy use and improved water recycling.

Module 4: Urban Mining, Recycling, and Product-as-a-Service (PaaS)

- Urban Mining Strategy.
- Circular Procurement.
- The PaaS Framework
- Remanufacturing and Overhauls.
- Scrap Metal Recovery Loops
- *Case Study:* Analyzing Caterpillar’s "Cat Reman" asset program, illustrating how rebuild partnerships cut capital expenses and equipment downtime for global mining operations.

Module 5: Downstream Orchestration and Closed-Loop Partnerships

- Direct OEM Integration.
- Value Chain Traceability.
- Scope 3 Emission Reductions.
- Secondary Market Positioning.
- Co-investment in Clean Tech
- *Case Study:* Examining Freeport-McMoRan and Rio Tinto’s partnerships with major automakers to supply traceable, certified low-carbon copper and aluminum for electric vehicle platforms.

Module 6: Circular Metrics, Analytics, and ESG Reporting Frameworks

- Circular Economy Performance Indicators.
- Life Cycle Assessment (LCA
- Regulatory Compliance
- Financial Return Analytics.
- ESG Investor Communication

- *Case Study:* Reviewing Umicore's circular business model reporting, showcasing how their integrated metric systems clearly present secondary resource financial performance to global ESG investors.

Module 7: Regenerative Mine Closure and Post-Mining Economies

- Progressive Reclamation Planning.
- Post-Mining Land Transformation
- Repurposing Underground Assets.
- Socio-Economic Transitions.
- Acid Mine Drainage Solutions.
- *Case Study:* Examining the conversion of the Kidston Gold Mine in Australia into a 250MW pumped-hydro and solar clean-energy facility.

Module 8: Circular Leadership, Culture, and Systemic Change

- Systems Thinking Leadership
- Overcoming Corporate Inertia.
- Aligning Incentives and KPIs
- Cross-Functional Team Collaboration
- De-Risking New Initiatives.
- *Case Study:* Exploring Boliden's corporate culture transformation, highlighting how aligning operational KPIs directly supported their lead in utilizing electronic scrap and secondary raw materials.

Training Methodology

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com