Blockchain in Mineral Supply Chains 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 transition toward clean energy technology and advanced electronics has triggered an unprecedented surge in the demand for critical minerals like cobalt, lithium, copper, and 3TG (tin, tantalum, tungsten, and gold). However, this demand is closely shadowed by complex challenges, including human rights violations, illicit financial flows, and environmental degradation across decentralized upstream corridors. Traditional, paper-heavy auditing systems frequently fail to prevent the laundering of conflict commodities into legitimate downstream markets due to systemic data fragmentation and a lack of baseline audit verification.

Blockchain in Mineral Supply Chains Training Course bridges the gap between legacy mining logistics and Distributed Ledger Technology (DLT) by providing a comprehensive masterclass on implementing enterprise blockchain networks across the mineral value chain. Participants will explore how immutable data ledgers, decentralized cryptographic consensus, and programmatic smart contracts can revolutionize chain-of-custody tracking from artisanal mine sites to global original equipment manufacturers. By demystifying the "garbage-in, garbage-out" paradox via robust hardware-to-digital physical mapping, this course empowers leaders to architect, govern, and execute interoperable blockchain solutions that verify ethical provenance, eliminate geopolitical compliance risks, and unlock green premium market valuations.

Programme Curriculum

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5 Days

Course Objectives

1. **Architect** secure Distributed Ledger Technology (DLT) networks tailored specifically for tracking raw materials and critical energy metals across complex global jurisdictions.
2. **Execute** the 5-Step Framework of the OECD Due Diligence Guidance.
3. **Mitigate** upstream supply chain fraud by implementing physical-to-digital asset mapping techniques
4. **Deploy** programmatic smart contracts to automate escrow payments.
5. **Formulate** robust data governance frameworks that integrate Zero-Knowledge Proofs (ZKPs) to verify regulatory compliance without compromising commercial trade secrets or pricing models.
6. **Dismantle** multi-tier corporate data silos by launching cross-border, interoperable blockchain channels that connect artisanal small-scale miners
7. **Generate** compliance reports using standardized frameworks
8. **Enforce** rigorous ESG traceability criteria regarding child labor prevention, fair compensation, and carbon footprint tracking at the exact point of mineral extraction
9. **Integrate** Edge Computing and IoT sensor nodes with decentralized nodes to eliminate human error during upstream data input
10. **Analyze** the tokenization of mineral assets, assessing the utility of non-fungible tokens.
11. **Evaluate** the operational trade-offs between Permissioned Consortium Blockchains.
12. **Future-proof** corporate compliance programs against emerging global mandates.
13. **Design** a comprehensive, production-ready corporate blockchain integration roadmap.

Target Audience

- Chief Sustainability Officers (CSOs) & ESG Directors
- Supply Chain Directors & Procurement Managers.
- Global Compliance Officers & Legal Counsels.
- Mining Operations Executives & Smelter Managers
- Commodity Traders & Trade Finance Professionals
- Artisanal Mining Cooperative Leaders & Development NGO Advisors
- Enterprise Software Architects & Blockchain Developers.
- Government Regulators & Policy Makers.

Course Modules

Module 1: Foundational Blockchain Architecture for Heavy Industry

- Decentralized Ledgers vs. Centralized Relational Databases.
- Consensus Mechanism Mechanics.
- Permissioned vs. Permissionless Networks.
- Cryptographic Primitives & Hashing.
- Smart Contract Engineering Foundations.
- **Case Study:** *Reviewing the LuNa Smelter Pilot in Rwanda*

Module 2: The Physical-to-Digital Bridge (Solving Data Integrity)

- The Upstream "Garbage-In, Garbage-Out" Dilemma
- Advanced Cryptographic Tagging and Hardware.
- Chemical and Molecular Fingerprinting
- IoT & Edge Computing Automation
- Reconciling Mass-Balance vs. Identity-Preserved Models.
- **Case Study:** *De Beers' Tracr Platform*

Module 3: Regulatory Compliance and International Frameworks

- Automating the OECD 5-Step Due Diligence Framework.
- Decentralized CMRT and EMRT Reporting
- US Dodd-Frank Section 1502 & EU 2021 Regulations
- Sanctions Enforcement and Geofenced Compliance
- Independent Third-Party Audit Optimization
- **Case Study:** *The Responsible Minerals Initiative (RMI) Blockchain Pilots*

Module 4: Critical Minerals, Battery Traceability, and Digital Product Passports

- The EU Battery Regulation Architecture
- Engineering a Digital Product Passport (DPP.
- Scope 3 Carbon Emissions Accounting.
- Traceability in Deep-Sea and Extreme Sourcing Environments
- Battery Circularity and Recycling Tracking
- **Case Study:** *Volkswagen's Lead and Cobalt Battery Tracking Project.*

Module 5: Data Privacy, Enterprise Security, and Confidentiality

- The Enterprise Dilemma (Transparency vs. Commercial Secrets
- Zero-Knowledge Proofs (ZKPs) in Action
- Private Channels and State Channels.
- Role-Based Access Control (RBAC) Architecture.
- Mitigating Decentralized Cybersecurity Vulnerabilities
- **Case Study:** *Glencore and BHP's Minsent Consortium Initiative.*

Module 6: Formalizing Artisanal and Small-Scale Mining (ASM) Ecosystems

- The ASM Traceability Paradox.
- Decentralized Identifiers (DIDs) for Individual Miners.
- Disintermediating Predatory Supply Corridors
- Mitigating Child Labor via On-Chain Attestation
- Micro-Trade Finance and Crypto-Remittances

- **Case Study:** *The Ethical Cobalt (Econet) Initiative in the DRC.*

Module 7: Smart Contracts, Tokenization, and Sustainable Commodity Financing

- Tokenizing the Mineral Value Chain.
- Automating Trade Finance with Smart Contracts
- DeFi (Decentralized Finance) Capital Liquidity Pools
- Provable Green Premiums
- Automating Royalty and Taxation Distribution.
- **Case Study:** *BHP's Blockchain-Enabled Iron Ore Trade with China Baosteel*

Module 8: Strategy, Interoperability, and Enterprise Implementation

- The Multi-Database Fragmentation Challenge: Addressing the problem of competing, isolated blockchain platforms across different global trade routes.
- Cross-Chain Interoperability Protocols.
- Legacy ERP System Integration
- Calculating Implementation ROI and TCO.
- The Corporate Blockchain Scaling Roadmap.
- **Case Study:** *The World Economic Forum's Mining and Metals Blockchain Initiative (MMBI*

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

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