Mine Waste Management 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

Mine waste management is a critical discipline within modern mining operations, focusing on the safe, sustainable, and compliant handling of waste materials such as tailings, waste rock, and process residues. With increasing global scrutiny on ESG (Environmental, Social & Governance) performance, climate resilience, and environmental accountability, mining companies are under pressure to adopt advanced tailings management systems, acid mine drainage (AMD) prevention strategies, and integrated waste reduction frameworks aligned with GISTM (Global Industry Standard on Tailings Management) and ISO 14001 environmental management systems.

This training course provides a comprehensive, competency-based approach to mine waste management, integrating engineering principles, geotechnical stability, environmental risk assessment, and sustainable mine closure planning. Participants will gain practical insights into tailings storage facility (TSF) design, circular economy applications in mining, and real-world disaster case studies such as Brumadinho and Samarco dam failures. Mine Waste Management Training Course is designed to equip professionals with cutting-edge skills in waste optimization, regulatory compliance, environmental remediation, and digital monitoring technologies for safer and more sustainable mining operations.

Programme Curriculum

Mine Waste Management Training Course

Introduction

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Course Duration

5 days

Course Objectives

1. Understand global mine waste management frameworks and regulatory compliance requirements
2. Apply GISTM principles for safe tailings storage facility (TSF) governance
3. Analyze geotechnical stability and failure risk mechanisms in mining waste structures
4. Implement acid mine drainage (AMD) prevention and treatment technologies
5. Evaluate waste rock characterization and segregation techniques
6. Develop environmental impact mitigation and ESG reporting strategies
7. Integrate real-time monitoring systems and IoT-based instrumentation
8. Design sustainable tailings storage facilities (TSF) using best engineering practices
9. Conduct mine waste risk assessments and hazard classification
10. Apply emergency preparedness and disaster response planning
11. Promote circular economy and waste valorization in mining operations
12. Execute mine closure and land rehabilitation planning frameworks
13. Strengthen regulatory auditing, compliance reporting, and sustainability governance

Target Audience

1. Mining engineers and metallurgical engineers
2. Environmental scientists and sustainability officers
3. Geotechnical and civil engineers
4. Tailings facility engineers and operators
5. Health, Safety & Environment (HSE) managers
6. Government mining regulators and inspectors
7. ESG and corporate sustainability professionals
8. Mining project managers and consultants

Course Modules

Module 1: Fundamentals of Mine Waste Management & Regulations

- Overview of mine waste types-tailings, waste rock, sludge
- Global regulations-**GISTM, ISO 14001, ICMM guidelines**
- Environmental and social impacts of poor waste handling
- Compliance frameworks and auditing requirements
- Case Study: **Samarco Dam Failure (Brazil) – regulatory breakdown analysis**

Module 2: Waste Characterization & Geochemical Analysis

- Physical and chemical properties of mine waste
- Acid generation potential and neutralization capacity
- Geochemical testing methods and interpretation
- Waste classification and segregation strategies
- Case Study: **Ok Tedi Mine (Papua New Guinea) environmental impact assessment**

Module 3: Tailings Storage Facility (TSF) Design & Engineering

- TSF design principles and construction methods
- Upstream, downstream, and centerline dam designs
- Water management and seepage control systems
- Structural integrity and geotechnical stability
- Case Study: **Brumadinho Disaster (Brazil) dam failure analysis**

Module 4: Acid Mine Drainage (AMD) Management

- Chemistry of acid mine drainage formation
- Prevention techniques and source control
- Passive and active treatment systems
- Long-term environmental monitoring strategies
- Case Study: AMD remediation project in **South African gold mines**

Module 5: Waste Rock Management & Landform Design

- Waste rock pile stability and erosion control
- Segregation of reactive vs non-reactive materials
- Hydrological control and drainage design
- Progressive rehabilitation techniques
- Case Study: **Canadian oil sands waste rock landform rehabilitation**

Module 6: Monitoring, Instrumentation & Digital Technologies

- Geotechnical monitoring systems
- Remote sensing and drone-based surveillance
- IoT integration for real-time TSF monitoring
- Data analytics and predictive failure modeling
- Case Study: Smart tailings monitoring implementation in **Australian mining operations**

Module 7: Risk Assessment & Emergency Response

- Hazard identification and risk matrix development
- Failure modes and effects analysis (FMEA)
- Emergency preparedness planning (EPP)
- Community safety and evacuation planning
- Case Study: **Mount Polley Tailings Breach (Canada)** emergency response review

Module 8: Mine Closure, Rehabilitation & Circular Economy

- Closure planning and post-mining land use design
- Ecosystem restoration and biodiversity recovery

- Waste valorization and reuse strategies
- Circular economy applications in mining waste
- Case Study: **Rehabilitation of decommissioned mines in Europe**

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

Start Date	End Date	Location	Price
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

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