Underground Equipment Operation 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

Underground Equipment Operation Training Course is designed to equip learners with advanced competencies in mining machinery operation, underground safety protocols, heavy equipment handling, and digital mining technologies. As global demand rises for skilled operators in underground mining, tunneling, and excavation industries, this course delivers practical, competency-based training aligned with modern Industry 4.0 mining standards, safety compliance frameworks, and real-world operational excellence.

This training focuses on developing highly skilled operators capable of safely and efficiently handling load haul dump (LHD) machines, underground haul trucks, drilling jumbos, bolters, and shuttle cars in complex underground environments. Learners will gain hands-on exposure to risk management systems, ventilation awareness, geotechnical safety, automation in mining equipment, and predictive maintenance practices. The course integrates simulated training environments, scenario-based learning, and field case studies to ensure operational readiness and compliance with international mining safety regulations such as ISO mining standards and OSHA-aligned underground safety practices.

Programme Curriculum

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Course Duration

5 days

Course Objectives

1. Master underground heavy equipment operation techniques
2. Apply advanced mine safety and hazard control protocols
3. Develop competence in LHD (Load Haul Dump) machine handling
4. Understand underground ventilation and air quality management
5. Implement predictive maintenance for mining equipment
6. Enhance skills in tunneling and excavation operations
7. Operate drilling jumbos and bolting machines efficiently
8. Apply real-time risk assessment and mitigation strategies
9. Improve equipment productivity and cycle time optimization
10. Understand geotechnical stability and ground control systems
11. Gain proficiency in mining automation and digital monitoring systems
12. Strengthen compliance with international mining safety regulations
13. Prepare for high-performance underground mining careers

Target Audience

1. Aspiring underground mining machine operators
2. Entry-level and experienced mine workers
3. Mining engineering students and graduates
4. Tunneling and excavation project workers
5. Heavy equipment operators transitioning to mining sector
6. Mining safety officers and supervisors
7. Technical training institutions and vocational learners
8. Industrial workforce seeking upskilling in mining automation

Course Modules

Module 1: Introduction to Underground Mining Systems

- Overview of underground mining methods
- Types of underground equipment and their applications
- Mining workflow and operational cycles
- Safety hierarchy and underground entry protocols
- Introduction to digital mine mapping systems
- **Case Study:** Analysis of productivity improvements in a mechanized gold mine after equipment modernization.

Module 2: Underground Equipment Fundamentals

- LHD machine structure and operational principles
- Underground haul truck systems and load handling
- Drilling jumbo mechanics and usage
- Hydraulic and pneumatic systems overview
- Equipment inspection and pre-start checks
- **Case Study:** Equipment failure reduction through structured pre-start inspection routines in a copper mine.

Module 3: Safety, Risk Management & Compliance

- Hazard identification in confined underground spaces
- Emergency evacuation and rescue procedures
- PPE standards for mining environments
- Ground fall prevention techniques
- Regulatory compliance
- **Case Study:** Reduction of underground accidents through improved risk assessment protocols in a platinum mine.

Module 4: Drilling and Blasting Operations

- Drill pattern design and execution
- Controlled blasting techniques
- Explosive handling safety procedures
- Vibration and shockwave management
- Post-blast inspection processes
- **Case Study:** Optimization of tunnel advancement rate in a metro rail project using precision blasting.

Module 5: Haulage, Loading & Material Handling

- Load cycle optimization techniques
- Efficient material transport systems
- Conveyor integration in underground mines
- Truck and loader coordination systems
- Productivity tracking and reporting
- **Case Study:** Increased ore extraction efficiency through synchronized haulage systems in an iron ore mine.

Module 6: Equipment Maintenance & Troubleshooting

- Preventive and predictive maintenance systems
- Hydraulic fault detection techniques
- Lubrication and wear analysis
- Breakdown troubleshooting procedures
- Maintenance reporting and digital logs
- **Case Study:** Reduction of downtime using predictive maintenance analytics in automated mining fleets.

Module 7: Ventilation, Environment & Geotechnical Control

- Underground airflow design principles
- Gas monitoring and detection systems

- Temperature and dust control strategies
- Rock stability and support systems
- Environmental sustainability in mining
- **Case Study:** Improved worker safety through advanced ventilation redesign in a deep-level mine.

Module 8: Automation & Smart Mining Technologies

- Autonomous underground equipment systems
- Remote-controlled mining operations
- IoT sensors in mining environments
- Real-time monitoring dashboards
- AI-driven predictive mining analytics
- **Case Study:** Productivity boost through autonomous LHD deployment in a high-production underground mine.

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:

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