Data Collection Techniques in Mining Operations 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

Modern mining operations are increasingly driven by data-centric decision-making, digital transformation, and real-time operational intelligence. The ability to accurately collect, validate, and analyze operational data has become a critical competency for improving mine productivity, safety compliance, ore grade control, equipment performance, and environmental sustainability. *Data Collection Techniques in Mining Operations* is designed to equip participants with advanced knowledge and practical skills in geological data capture, production reporting systems, sensor-based monitoring, IoT integration, and digital data acquisition workflows used in both surface and underground mining environments.

With the rapid adoption of Industry 4.0 technologies, smart mining systems, automation, and predictive analytics, mining professionals must understand how to generate high-quality datasets that support operational efficiency, risk management, and strategic planning. This course focuses on standardized data collection methodologies, field instrumentation, sampling techniques, digital logging systems, and real-time reporting tools. Participants will gain hands-on exposure to modern mining technologies such as GIS mapping systems, SCADA platforms, drone surveying, and cloud-based mining data platforms, ensuring they are fully prepared to meet the demands of next-generation mining operations.

Programme Curriculum

Data Collection Techniques in Mining Operations Training Course

Introduction

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Course Duration

5 Days

Course Objectives

1. Understand advanced mining data acquisition systems and digital reporting frameworks
2. Apply geological and geotechnical data collection techniques in mining environments
3. Implement real-time operational data monitoring and sensor integration systems
4. Develop competency in ore sampling, assay data collection, and quality control methods
5. Utilize IoT-enabled mining equipment for automated data capture
6. Interpret production data analytics for productivity optimization
7. Apply safety-critical data collection and incident reporting systems
8. Master surveying data techniques using GPS, drones, and GIS technologies
9. Ensure data accuracy, validation, and integrity in mining operations
10. Integrate SCADA and mine automation systems for operational monitoring
11. Analyze environmental monitoring data for compliance and sustainability
12. Use cloud-based mining data platforms for centralized reporting
13. Develop decision-support insights using mining operational datasets

Target Audience

1. Mining Engineers
2. Geologists and Exploration Specialists
3. Surveyors and GIS Technicians
4. Mine Managers and Supervisors
5. Data Analysts in Mining Operations
6. Health, Safety & Environmental (HSE) Officers
7. Equipment Operators and Maintenance Planners
8. Mining Technology and Automation Specialists

Course Modules

Module 1: Fundamentals of Mining Data Systems

- Overview of mining data lifecycle
- Types of mining operational data
- Data flow in surface and underground mines
- Introduction to digital mining ecosystems

- Data governance and reporting standards
- **Case Study:** Implementation of centralized data reporting in a large open-pit copper mine to reduce reporting delays by 40%.

Module 2: Geological and Exploration Data Collection

- Core sampling techniques
- Drill hole logging systems
- Assay data recording and validation
- Geological modeling inputs
- Field data recording tools
- **Case Study:** Improving ore body modeling accuracy through standardized drill logging in a gold mining operation.

Module 3: Surveying, GIS, and Spatial Data Capture

- GPS and total station surveying methods
- Drone-based aerial mapping
- GIS integration in mining operations
- Spatial data accuracy and calibration
- Topographic data processing
- **Case Study:** Use of drone mapping to optimize blast planning in a coal mine.

Module 4: Production Data Collection Systems

- Shift production reporting systems
- Equipment utilization tracking
- Ore extraction and haulage data
- Digital shift logs and dashboards
- KPI-based production monitoring
- **Case Study:** Reducing downtime by 25% using real-time haul truck tracking systems.

Module 5: Sensor-Based and IoT Data Acquisition

- IoT sensors in mining equipment
- Real-time monitoring systems
- Condition-based maintenance data
- SCADA integration
- Automated alert systems
- **Case Study:** Predictive maintenance system reducing equipment failure in an underground mine.

Module 6: Safety and Environmental Data Collection

- Incident reporting systems
- Environmental monitoring sensors
- Air quality and dust tracking
- Water quality measurement systems
- Compliance reporting frameworks
- **Case Study:** Improved environmental compliance using continuous dust monitoring systems.

Module 7: Data Management, Validation & Quality Control

- Data cleaning and verification methods
- Error detection techniques
- Database management systems
- Data integrity frameworks
- Audit and compliance processes
- **Case Study:** Eliminating production reporting inconsistencies through automated validation systems.

Module 8: Digital Mining Platforms and Analytics

- Cloud-based mining dashboards
- Data visualization tools
- Predictive analytics in mining
- Machine learning applications
- Decision support systems
- **Case Study:** Increasing productivity forecasting accuracy using AI-driven mine scheduling tools.

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