# Big Data Mining Training Course

Professional Development Training Course Outline

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|---|---|---|---|
| **Category** | General Training | **Duration** | 10 Days |
| **Base Fee** | $3,000 USD | **Delivery Mode** | Online / On-site Hybrid |

## Course Introduction

The Big Data in Mining is designed to equip learners with advanced capabilities in Big Data Analytics, predictive intelligence, and industrial mining optimization using modern data-driven technologies. With the rapid expansion of IoT-enabled mining operations, AI-driven exploration, and real-time sensor data, the mining industry is transforming into a highly digitized ecosystem where data is the new core resource. Big Data Mining Training Course focuses on integrating machine learning, data engineering, and geospatial analytics to solve complex mining challenges such as ore grade prediction, equipment failure detection, and operational efficiency improvement.

Participants will gain hands-on expertise in tools like Apache Spark, Apache Hadoop, Python-based analytics, and cloud-based mining data platforms. The program emphasizes real-world mining applications including predictive maintenance, autonomous mining systems, safety monitoring, and resource optimization, enabling professionals to transition into high-demand roles in mining analytics, data engineering, and industrial AI transformation.

## Programme Curriculum

**Big Data Mining Training Course**

**Introduction**

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**Course Duration**

10 Days

**Course Objectives**

1. Master Big Data Analytics in Smart Mining Operations
2. Understand IoT-based Mining Data Collection & Processing
3. Apply Machine Learning for Ore Grade Prediction
4. Develop skills in Predictive Maintenance using Sensor Data
5. Implement Real-time Mining Data Streaming Analytics
6. Use Apache Spark for Large-scale Mining Data Processing
7. Build Hadoop-based Mining Data Lakes
8. Perform Geospatial Data Analysis for Mineral Exploration
9. Design AI-powered Mining Safety Systems
10. Optimize Mining Supply Chain using Data Science
11. Analyze Equipment Failure Patterns using Big Data
12. Deploy Cloud-based Mining Analytics Solutions
13. Integrate Digital Twin Technology in Mining Operations

**Target Audience**

1. Mining Engineers & Geologists
2. Data Scientists & Data Analysts
3. Industrial Automation Engineers
4. AI/ML Engineers in Heavy Industries
5. Mining Operations Managers
6. Environmental & Safety Engineers
7. IT Professionals in Mining Sector
8. Students in Mining, Data Science, or Industrial Engineering

**Course Modules**

**Module 1: Introduction to Big Data in Mining**

- Overview of digital mining transformation
- Data types in mining operations
- Role of AI in mining industry
- Mining analytics ecosystem
- Case Study: Digital transformation at an open-pit mine

**Module 2: Mining Data Ecosystem & Architecture**

- Data pipelines in mining operations
- Structured vs unstructured mining data
- Cloud and edge computing in mines

- Data ingestion frameworks
- Case Study: Smart mine data architecture deployment

**Module 3: IoT in Mining Operations**

- Sensor networks in mining equipment
- Real-time data acquisition systems
- IoT communication protocols
- Equipment monitoring systems
- Case Study: Underground mine IoT monitoring system

**Module 4: Data Engineering for Mining**

- ETL pipelines for mining data
- Data cleaning and preprocessing
- Data integration techniques
- Scalable storage systems
- Case Study: Building mining data warehouse

**Module 5: Apache Hadoop for Mining Data**

- HDFS architecture
- Distributed processing concepts
- Mining data storage solutions
- Batch processing techniques
- Case Study: Large-scale ore data storage system

**Module 6: Apache Spark for Mining Analytics**

- Spark architecture overview
- Real-time processing in mining
- RDDs and DataFrames
- Streaming analytics
- Case Study: Real-time equipment monitoring system

**Module 7: Machine Learning in Mining**

- Supervised and unsupervised learning
- Ore classification models
- Predictive modeling techniques
- Feature engineering
- Case Study: Mineral deposit prediction model

**Module 8: Predictive Maintenance Systems**

- Failure prediction models
- Sensor-based anomaly detection
- Maintenance scheduling optimization
- Reliability engineering
- Case Study: Truck fleet predictive maintenance

**Module 9: Geospatial Data Analytics**

- GIS systems in mining
- Spatial data processing
- Mineral exploration mapping
- Remote sensing data usage
- Case Study: Satellite-based mineral detection

**Module 10: Data Visualization & Dashboards**

- Mining KPI dashboards
- Visualization tools and techniques
- Real-time monitoring dashboards
- Reporting systems
- Case Study: Mine productivity dashboard

**Module 11: AI in Autonomous Mining**

- Autonomous haulage systems
- Computer vision in mining
- Robotics in excavation
- AI decision systems
- Case Study: Autonomous dump truck operations

**Module 12: Safety Analytics in Mining**

- Hazard detection systems
- Worker safety monitoring
- Environmental risk analysis
- Compliance analytics
- Case Study: AI-based mine safety alert system

**Module 13: Cloud Computing in Mining**

- Cloud platforms for mining data
- Scalable analytics systems
- Hybrid cloud mining architecture
- Data security in cloud mining
- Case Study: Cloud-based mine control system

**Module 14: Digital Twin Technology**

- Digital replica of mining assets
- Simulation models
- Real-time synchronization
- Performance optimization
- Case Study: Digital twin of underground mine

**Module 15: Advanced Mining Analytics Project**

- End-to-end mining analytics pipeline
- Model deployment strategies
- Industrial case implementation
- Performance evaluation metrics

- Case Study: Smart mine optimization project

### 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** | 04 Dec 2026 | Online | $2,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $3,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $6,000 |

| Start Date | End Date | Location | Price |
|---|---|---|---|
| **23 Nov 2026** | 04 Dec 2026 | Physical | $6,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $12,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $9,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $12,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $12,000 |

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

**Register Online Now**

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