Decision Support Systems in Mining 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

Decision Support Systems (DSS) in Mining Training Course is designed to equip professionals with advanced capabilities in data-driven mining operations, AI-powered analytics, predictive modeling, and digital mine optimization. In today's rapidly evolving Mining 4.0 ecosystem, organizations rely on intelligent DSS platforms to improve ore grade control, production efficiency, safety management, and real-time operational decision-making. This training integrates machine learning, big data analytics, geospatial intelligence, and operational research techniques to transform traditional mining into a fully optimized, smart mining environment.

This course emphasizes practical applications of decision intelligence systems, mining automation, real-time dashboarding, and risk-based decision frameworks. Learners will explore how DSS tools enhance exploration accuracy, resource estimation, equipment utilization, and cost optimization across underground and surface mining operations. By combining simulation models, predictive analytics, and case-based learning, participants will gain the ability to design and implement intelligent decision systems that drive productivity, sustainability, and profitability in modern mining enterprises.

Programme Curriculum

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Course Objectives

1. Understand core principles of Decision Support Systems (DSS) in Mining Industry 4.0
2. Apply AI-driven predictive analytics for mineral exploration and ore classification
3. Design intelligent mine planning and scheduling systems
4. Improve production optimization using real-time data analytics
5. Integrate GIS and geospatial intelligence into mining decision workflows
6. Utilize big data mining analytics platforms for operational insights
7. Develop risk-based decision-making models for mining safety
8. Enhance equipment performance monitoring and predictive maintenance
9. Apply machine learning algorithms for ore grade estimation
10. Build interactive dashboards for mining operations control
11. Optimize supply chain and logistics in mining operations
12. Improve cost control and resource allocation using DSS tools
13. Implement sustainable and eco-efficient mining decision systems

Target Audience

1. Mining engineers and geologists
2. Data analysts in mining and exploration companies
3. Mine planning and production managers
4. GIS and remote sensing specialists
5. Operations and maintenance engineers
6. Mining safety and risk management professionals
7. Government mining regulators and inspectors
8. Students and researchers in mining engineering and data science

Course Modules

Module 1: Fundamentals of DSS in Mining Operations

- Concepts of DSS and Mining 4.0 ecosystem
- Types of decision models in mining
- Data-driven mining transformation
- DSS architecture and components
- Role of AI in mining decision systems
- **Case Study:** Implementation of DSS in an open-pit copper mine for production optimization

Module 2: Mining Data Analytics & Big Data Systems

- Mining data lifecycle and processing
- Big data platforms in mining
- Data integration from sensors and IoT
- Descriptive and diagnostic analytics
- Data quality management in mining systems
- **Case Study:** Real-time analytics in underground coal mining operations

Module 3: AI & Machine Learning in Mineral Exploration

- ML models for ore prediction
- Pattern recognition in geological data
- Neural networks in mineral classification
- Predictive exploration mapping
- Model validation techniques
- **Case Study:** AI-based gold deposit prediction system

Module 4: GIS & Geospatial Decision Systems

- Spatial data analysis in mining
- Remote sensing applications
- 3D geological modeling
- Spatial decision support systems
- Terrain and site suitability analysis
- **Case Study:** GIS-based site selection for a new iron ore mine

Module 5: Mine Planning & Production Scheduling DSS

- Short-term and long-term mine planning
- Optimization algorithms in scheduling
- Resource allocation models
- Production forecasting techniques
- Scenario simulation tools
- **Case Study:** Automated scheduling system in a platinum mine

Module 6: Risk, Safety & Environmental DSS

- Risk assessment models in mining
- Hazard prediction systems
- Safety monitoring dashboards
- Environmental impact analysis
- Emergency decision frameworks
- **Case Study:** DSS implementation for mine safety incident reduction

Module 7: Equipment Monitoring & Predictive Maintenance

- Sensor-based equipment tracking
- Predictive maintenance analytics
- Failure prediction models
- Asset utilization optimization
- Maintenance scheduling systems
- **Case Study:** Truck fleet optimization in large-scale mining operations

Module 8: Strategic Decision Intelligence & Sustainability

- Strategic DSS frameworks
- ESG and sustainable mining analytics
- Carbon footprint optimization
- Cost-benefit decision modeling
- Future trends in autonomous mining systems
- **Case Study:** Sustainable mining optimization in a lithium extraction 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	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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