GIS for Mining Applications 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

Geographic Information Systems (GIS) have become a transformative force in modern mining, enabling data-driven decision-making, precision exploration, operational efficiency, and sustainable resource management. The integration of GIS in mining workflows supports advanced spatial analysis, mineral targeting, terrain modeling, environmental impact assessment, and asset management. With the rise of digital mining, smart mining, AI-driven geospatial analytics, remote sensing, LiDAR, and cloud-based GIS platforms, mining organizations are increasingly relying on spatial intelligence to optimize exploration and production while reducing operational risks and costs.

This GIS for Mining Applications Training Course is designed to equip professionals with cutting-edge skills in geospatial technologies tailored specifically for the mining sector. The course focuses on real-world applications such as mineral exploration targeting, geological mapping, mine planning, environmental monitoring, and resource optimization using industry-leading GIS tools. Participants will gain hands-on experience in integrating satellite imagery, spatial databases, 3D geological modeling, and predictive spatial analytics to solve complex mining challenges. The program aligns with global trends in sustainable mining, digital transformation, ESG compliance, and geospatial AI, ensuring learners are industry-ready for modern mining environments.

Programme Curriculum

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Course Duration

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Course Objectives

1. Master GIS fundamentals for mining exploration and spatial intelligence
2. Apply remote sensing and satellite imagery for mineral mapping
3. Develop 3D geological and geospatial modeling techniques
4. Use LiDAR and drone data for mine site analysis
5. Perform spatial data integration for mining decision support systems
6. Conduct mineral prospectivity mapping using predictive analytics
7. Implement digital terrain modeling (DTM) and surface analysis
8. Utilize AI-powered geospatial analytics in mining workflows
9. Design mine planning and optimization using GIS tools
10. Analyze environmental impact assessment (EIA) using spatial data
11. Manage geodatabases for mining asset and resource management
12. Apply cloud GIS and real-time geospatial monitoring systems
13. Support ESG compliance and sustainable mining practices through GIS

Target Audience

1. Mining Engineers
2. Geologists & Exploration Geoscientists
3. GIS Analysts & Remote Sensing Specialists
4. Surveyors & Cartographers
5. Environmental Scientists in Mining Sector
6. Mine Planning & Production Managers
7. Government Mining Regulators & Inspectors
8. Data Scientists working in Geospatial Mining Analytics

Course Modules

Module 1: Introduction to GIS in Mining

- GIS concepts and mining lifecycle integration
- Spatial data types in mining operations
- Coordinate systems and georeferencing
- Overview of mining GIS platforms

- Case Study: GIS adoption in open-pit coal mining optimization

Module 2: Remote Sensing & Satellite Imagery

- Multispectral and hyperspectral image analysis
- Mineral alteration mapping techniques
- Image classification for exploration
- Satellite data sources
- Case Study: Copper deposit identification using satellite imagery

Module 3: Geological Mapping & 3D Modeling

- Digital geological mapping techniques
- 3D subsurface modeling
- Structural geology visualization
- Stratigraphic interpretation using GIS
- Case Study: 3D gold ore body modeling in underground mining

Module 4: LiDAR & Drone Applications

- UAV data acquisition for mining sites
- LiDAR point cloud processing
- Terrain reconstruction and volumetric analysis
- Stockpile measurement techniques
- Case Study: Drone-based quarry volume estimation

Module 5: Spatial Analysis & Mineral Targeting

- Buffering, overlay, and spatial interpolation
- Geostatistics in mineral exploration
- Prospectivity mapping models
- Risk zone identification
- Case Study: Zinc deposit targeting using GIS overlay analysis

Module 6: Mine Planning & Optimization

- Pit design and slope analysis
- Haul road optimization
- Resource estimation workflows
- Production scheduling with GIS
- Case Study: Open-pit iron ore mine planning optimization

Module 7: Environmental Monitoring & ESG

- Land degradation mapping
- Water contamination tracking
- Rehabilitation planning
- Carbon footprint spatial analysis
- Case Study: Environmental impact monitoring in platinum mining

Module 8: Geodatabases & Digital Mining Systems

- Spatial database design

- Real-time mining dashboards
- Cloud GIS integration
- IoT and sensor data integration
- Case Study: Smart mine digital twin implementation

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