Remote Sensing & Satellite 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

Remote Sensing & Satellite Mining is a rapidly evolving, high-demand field that integrates Geospatial Intelligence (GEOINT), AI-powered Earth Observation, hyperspectral imaging, and satellite data analytics to transform how mineral resources are discovered, mapped, and managed. Remote Sensing & Satellite Mining Training Course is designed to equip learners with cutting-edge skills in GIS (Geographic Information Systems), LiDAR analysis, multispectral and hyperspectral satellite data interpretation, and predictive mineral exploration modeling. With the rise of Industry 4.0, digital mining, and smart exploration technologies, satellite-based mineral detection has become a critical tool for reducing exploration costs, improving accuracy, and enhancing environmental sustainability.

This program provides a comprehensive, hands-on learning experience in remote sensing applications for mining exploration, geological mapping, anomaly detection, and AI-driven mineral prospectivity analysis. Participants will gain practical expertise in platforms such as Google Earth Engine, QGIS, ArcGIS Pro, ENVI, and Python-based geospatial libraries. The course emphasizes real-world case studies from global mining operations, enabling learners to understand how satellite data supports gold, lithium, copper, rare earth element (REE), and oil & gas exploration. By the end of the training, participants will be able to independently analyze satellite datasets and generate actionable mining intelligence for decision-making.

Programme Curriculum

Remote Sensing & Satellite Mining Training Course

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Course Duration

5 days

Course Objectives

1. Master Remote Sensing fundamentals for mineral exploration
2. Apply GIS-based spatial analysis for mining prospectivity mapping
3. Interpret multispectral and hyperspectral satellite imagery
4. Utilize LiDAR technology for terrain and geological structure analysis
5. Develop AI and Machine Learning models for mineral prediction
6. Conduct lineament and structural geology extraction using satellite data
7. Perform change detection analysis for mining impact assessment
8. Use Google Earth Engine for large-scale geospatial processing
9. Integrate Python geospatial libraries
10. Identify mineral anomalies using spectral signature analysis
11. Build 3D geological and terrain models using remote sensing data
12. Apply sustainable mining and environmental monitoring techniques
13. Generate professional mining intelligence reports and dashboards

Target Audience

1. Mining Engineers
2. Geologists & Exploration Geoscientists
3. GIS Analysts & Remote Sensing Specialists
4. Environmental Scientists
5. Petroleum & Natural Resource Engineers
6. Data Scientists in Geospatial Analytics
7. Government Mining & Survey Departments
8. University Students in Earth Sciences & Geoinformatics

Course Modules

Module 1: Fundamentals of Remote Sensing & GIS in Mining

- Principles of electromagnetic spectrum and satellite imaging
- Introduction to GIS for mineral exploration
- Types of satellite sensors

- Spatial resolution vs spectral resolution in mining
- Case Study: Satellite-based iron ore mapping in Australia

Module 2: Satellite Image Processing & Interpretation

- Image correction
- Image enhancement techniques for geology
- Band combination and false-color composites
- Feature extraction for mineral zones
- Case Study: Copper belt detection using Landsat imagery

Module 3: Hyperspectral & Multispectral Mineral Analysis

- Spectral signature identification of minerals
- Hyperspectral imaging for alteration mapping
- Clay, carbonate, and oxide mineral detection
- Spectral Angle Mapper (SAM) technique
- Case Study: Gold exploration using hyperspectral data in Africa

Module 4: Structural Geology & Lineament Mapping

- Fault and fracture detection using satellite data
- Automatic lineament extraction techniques
- Tectonic interpretation for mineral deposits
- Terrain analysis using DEM and slope models
- Case Study: Diamond exploration in kimberlite regions

Module 5: LiDAR & 3D Terrain Modeling

- LiDAR fundamentals in mining exploration
- Digital Elevation Models creation
- 3D geological visualization techniques
- Volume estimation for open-pit mines
- Case Study: Quarry expansion monitoring using LiDAR

Module 6: AI, Machine Learning & Predictive Mining

- Supervised and unsupervised classification techniques
- Mineral prospectivity modeling using ML algorithms
- Python-based geospatial AI workflows
- Anomaly detection in satellite datasets
- Case Study: Lithium deposit prediction using AI models

Module 7: Google Earth Engine & Cloud Geospatial Analysis

- Introduction to cloud-based geospatial computing
- Processing large satellite datasets in GEE
- Time-series analysis for mining activity monitoring
- NDVI and land degradation assessment
- Case Study: Illegal mining detection using satellite time series

Module 8: Environmental Monitoring & Mining Intelligence

- Environmental impact assessment using remote sensing
- Water pollution and tailing dam monitoring
- Land reclamation and sustainability mapping
- Dashboard creation for mining intelligence reporting
- Case Study: Post-mining land restoration in South America

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

Start Date	End Date	Location	Price
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:

Register Online Now

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