Mineral Prospectivity Mapping 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

Mineral Prospectivity Mapping (MPM) Training Course is designed to equip professionals with advanced knowledge and practical skills in AI-driven mineral exploration, geospatial analytics, predictive modeling, machine learning, remote sensing, geostatistics, and spatial data integration. With the global mining industry rapidly embracing digital transformation, sustainable mining, ESG compliance, critical minerals exploration, and big data analytics, this course provides participants with cutting-edge methodologies used in modern mineral targeting and resource discovery. The training emphasizes industry-relevant tools such as GIS platforms, mineral systems modeling, geophysical interpretation, geochemical anomaly detection, spatial statistics, and data-driven exploration workflows to improve exploration success rates and reduce investment risks.

Participants will gain hands-on experience in developing high-confidence mineral prospectivity maps using integrated datasets from geology, geochemistry, geophysics, satellite imagery, structural interpretation, and machine learning algorithms. The course combines practical case studies, real-world exploration datasets, predictive analytics, and advanced GIS applications to support strategic decision-making in mineral exploration projects. By the end of the training, participants will be able to apply innovative prospectivity mapping techniques for exploration targeting of gold, copper, lithium, rare earth elements (REEs), uranium, battery minerals, and critical raw materials within both greenfield and brownfield exploration environments.

Programme Curriculum

Mineral Prospectivity Mapping Training Course

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Course Objectives

1. Understand the fundamentals of Mineral Prospectivity Mapping (MPM) and mineral systems analysis.
2. Apply GIS and spatial analytics for mineral exploration targeting.
3. Integrate geological, geochemical, geophysical, and remote sensing datasets for predictive modeling.
4. Utilize Artificial Intelligence (AI) and Machine Learning (ML) in mineral exploration workflows.
5. Develop skills in predictive mineral targeting and anomaly detection.
6. Analyze satellite imagery and hyperspectral data for mineral identification.
7. Apply geostatistics and spatial data science in exploration projects.
8. Design data-driven exploration strategies for critical minerals and battery metals.
9. Understand deep learning applications in geoscience and mineral prediction.
10. Evaluate exploration risks using probability modeling and uncertainty analysis.
11. Generate high-quality mineral prospectivity maps and exploration reports.
12. Interpret structural controls using 3D geological modeling and tectonic analysis.
13. Enhance decision-making using big data analytics, cloud GIS, and digital mining technologies.

Target Audience

1. Exploration Geologists
2. Mining Engineers
3. GIS and Remote Sensing Specialists
4. Geophysicists and Geochemists
5. Mineral Resource Analysts
6. Environmental and ESG Professionals in Mining
7. Researchers and Academics in Geosciences
8. Government Geological Survey and Mining Agency Professionals

Course Modules

Module 1: Fundamentals of Mineral Prospectivity Mapping

- Introduction to Mineral Prospectivity Mapping (MPM)
- Mineral systems approach and exploration concepts

- Types of mineral deposits and exploration models
- Data requirements for prospectivity analysis
- Overview of AI and digital transformation in mining
- **Case Study:** Gold mineral prospectivity mapping in greenstone belts

Module 2: GIS and Spatial Data Management

- GIS fundamentals for mineral exploration
- Spatial database creation and management
- Coordinate systems and geospatial data integration
- Raster and vector data processing
- Spatial interpolation and visualization techniques
- **Case Study:** GIS-based copper exploration targeting workflow

Module 3: Geological and Structural Data Interpretation

- Lithological and structural mapping techniques
- Faults, fractures, and tectonic controls on mineralization
- Geological map interpretation using GIS
- 3D geological modeling concepts
- Structural analysis for mineral targeting
- **Case Study:** Structural controls on gold mineralization in shear zones

Module 4: Geochemical and Geophysical Data Analysis

- Geochemical anomaly detection methods
- Geophysical datasets for exploration targeting
- Magnetic, gravity, radiometric, and EM interpretation
- Multivariate statistical analysis
- Data fusion techniques for exploration modeling
- **Case Study:** Integrated geophysical and geochemical targeting for copper deposits

Module 5: Remote Sensing and Hyperspectral Applications

- Remote sensing principles in mining exploration
- Satellite image processing techniques
- Hyperspectral mineral mapping
- Alteration zone identification using spectral analysis
- Drone and UAV applications in exploration
- **Case Study:** Remote sensing for lithium-bearing pegmatite exploration

Module 6: Machine Learning and AI in Mineral Exploration

- Introduction to machine learning algorithms
- Supervised and unsupervised learning methods
- Predictive analytics for mineral targeting
- Deep learning applications in geoscience
- AI-driven mineral prospectivity modeling workflows
- **Case Study:** AI-based gold prospectivity prediction using Random Forest models

Module 7: Prospectivity Modeling Techniques

- Knowledge-driven prospectivity mapping
- Data-driven modeling approaches
- Weights of Evidence (WoE) and Fuzzy Logic methods
- Logistic regression and Bayesian approaches
- Validation and uncertainty assessment techniques
- **Case Study:** Rare earth element (REE) prospectivity mapping using fuzzy logic

Module 8: Reporting, Decision Support, and Industry Applications

- Mineral prospectivity map preparation and reporting
- Exploration risk assessment and decision support systems
- ESG and sustainability considerations in exploration
- Cloud GIS and digital mining platforms
- Emerging trends in smart mining and Industry 4.0
- **Case Study:** Critical minerals exploration strategy for sustainable energy transition

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