Gold Deposit Exploration Methods 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

Gold exploration is a high-value segment of the global mining industry, driven by rising demand for precious metals, green energy transition technologies, and investment hedging strategies. Modern gold deposit exploration methods integrate advanced geoscience, geophysical surveys, geochemical analysis, AI-driven mineral targeting, and remote sensing technologies to improve discovery success rates and reduce exploration risk. This training course provides a comprehensive, industry-aligned foundation for professionals seeking expertise in mineral exploration, ore deposit modeling, and predictive geology workflows.

Gold Deposit Exploration Methods Training Course is designed to bridge classical exploration techniques with cutting-edge digital mining innovations such as machine learning mineral prospectivity mapping, 3D geological modeling, GIS-based targeting, and hyperspectral imaging analysis. Participants will gain hands-on knowledge of how gold deposits are identified, evaluated, and validated from grassroots exploration through to advanced drilling programs, ensuring alignment with modern mining industry standards and ESG-driven exploration strategies.

Programme Curriculum

Gold Deposit Exploration Methods Training Course

Introduction

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Course Duration

5 days

Course Objectives

1. Understand global gold exploration systems and ore-forming processes
2. Apply structural geology interpretation for gold deposit targeting
3. Conduct geochemical anomaly detection and soil sampling analysis
4. Use geophysical exploration techniques
5. Develop GIS-based mineral prospectivity mapping models
6. Interpret remote sensing and hyperspectral mineral data
7. Build 3D geological and ore body models
8. Integrate AI and machine learning in mineral exploration
9. Identify greenstone belt and orogenic gold systems
10. Evaluate drill core logging and assay data interpretation
11. Apply exploration risk assessment and decision-making tools
12. Understand resource estimation and feasibility study basics
13. Implement ESG-compliant and sustainable exploration practices

Target Audience

1. Exploration geologists
2. Mining engineers
3. Geophysicists
4. Geochemists
5. GIS and remote sensing specialists
6. Mining project managers
7. Graduate geology students
8. Mineral exploration consultants

Course Modules

Module 1: Fundamentals of Gold Mineral Systems

- Types of gold deposits-orogenic, epithermal, placer, intrusion-related
- Ore-forming processes and hydrothermal systems
- Crustal evolution and gold concentration mechanisms
- Global gold metallogenic belts
- Exploration lifecycle overview
- **Case Study:** Witwatersrand Basin gold system (South Africa) geological evolution analysis

Module 2: Structural Geology for Gold Exploration

- Faults, shear zones, and mineralized corridors

- Structural controls on gold emplacement
- Stress regimes and deformation analysis
- Field mapping techniques
- Structural interpretation using satellite imagery
- **Case Study:** Abitibi Greenstone Belt structural gold controls (Canada)

Module 3: Geochemical Exploration Techniques

- Soil, stream sediment, and rock sampling strategies
- Pathfinder elements
- Anomaly detection and threshold modeling
- Laboratory assay interpretation
- Multi-element geochemical datasets
- **Case Study:** Supergene gold anomaly detection in Yilgarn Craton (Australia)

Module 4: Geophysical Survey Methods

- Magnetic survey interpretation for ore bodies
- Induced Polarization (IP) and resistivity methods
- Gravity survey applications
- Data processing and inversion modeling
- Integration with geological datasets
- **Case Study:** IP anomaly targeting in Nevada Carlin-type gold deposits (USA)

Module 5: Remote Sensing & Hyperspectral Analysis

- Satellite-based mineral mapping
- Alteration mineral identification
- ASTER and Landsat datasets
- Hyperspectral imaging for hydrothermal alteration
- Lineament and structural mapping
- **Case Study:** Porgera gold mine remote sensing targeting (Papua New Guinea)

Module 6: GIS & 3D Geological Modeling

- Spatial data integration in GIS platforms
- Ore body modeling techniques
- 3D visualization of mineral systems
- Data layering and predictive mapping
- Deposit targeting algorithms
- **Case Study:** 3D modeling of Sukari gold deposit (Egypt)

Module 7: Drilling, Sampling & Resource Estimation

- Diamond drilling and RC drilling techniques
- Core logging and lithological classification
- Assay QA/QC protocols
- Resource classification
- Data validation workflows
- **Case Study:** Drill program optimization at Kibali gold mine (DRC)

Module 8: AI, Machine Learning & Modern Exploration Systems

- Predictive mineral targeting using AI models
- Big data integration in exploration
- Neural networks for prospectivity mapping
- Automation in geological interpretation
- ESG and digital mine planning systems
- **Case Study:** Machine learning-driven exploration in Western Australia goldfields

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