Orebody Delineation Techniques Training Course

Professional Development Training Course Outline

Category	General Training	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

The Orebody Delineation Techniques is designed to equip geoscientists, mining engineers, and exploration professionals with advanced skills in mineral resource modeling, orebody geometry interpretation, geological modelling, and geostatistical analysis. Orebody Delineation Techniques Training Course emphasizes cutting-edge workflows used in modern mining exploration, resource estimation, 3D geological modeling, and grade control optimization, enabling participants to confidently interpret complex orebody systems and improve decision-making in high-value mining projects.

With increasing demand for data-driven mining, AI-integrated geological modeling, and precision resource estimation, this course bridges traditional geological principles with modern digital tools such as 3D visualization software, geostatistics, machine learning in geology, and remote sensing integration. Participants will gain hands-on expertise in orebody continuity analysis, structural controls, and mineralization patterns to support efficient mine planning, feasibility studies, and sustainable resource extraction strategies aligned with global mining standards.

Programme Curriculum

Orebody Delineation Techniques Training Course

Introduction

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Course Objectives

1. Master orebody geometry interpretation using modern 3D modeling tools
2. Apply geostatistical analysis for mineral resource estimation
3. Understand structural geology controls on mineralization trends
4. Develop skills in 3D geological modelling and visualization
5. Perform drillhole data validation and compositing techniques
6. Integrate AI-driven mineral exploration workflows
7. Enhance accuracy in grade continuity and ore boundary definition
8. Apply remote sensing and geophysical data integration
9. Conduct wireframing and solid modeling of ore deposits
10. Improve resource classification (Measured, Indicated, Inferred)
11. Use variography and spatial analysis for ore prediction
12. Strengthen mine planning and ore control strategies
13. Apply sustainable mining and resource optimization techniques

Target Audience

- Exploration Geologists
- Mining Engineers
- Resource Geologists
- Geostatisticians
- Mine Planners
- Geological Data Analysts
- Geophysicists
- Graduate Students in Earth Sciences

Course Modules

Module 1: Fundamentals of Orebody Delineation

- Orebody definition principles
- Mineral deposit types overview
- Geological controls on ore formation
- Spatial distribution fundamentals
- Exploration lifecycle understanding
- **Case Study:** Gold reef delineation in Archean greenstone belts

Module 2: Structural Geology for Ore Control

- Fault and fold interpretation

- Stress field analysis
- Structural mapping techniques
- Mineralized shear zones
- Deformation history analysis
- **Case Study:** Porphyry copper structural control system

Module 3: Drillhole Data Management

- Drillhole database design
- Logging standards (litology, alteration)
- QA/QC protocols
- Data validation workflows
- Compositing techniques
- **Case Study:** Iron ore drilling dataset validation project

Module 4: 3D Geological Modelling

- Wireframing ore bodies
- Solid modeling techniques
- Cross-section correlation
- Geological surfaces creation
- Software-based modelling workflows
- **Case Study:** 3D modelling of platinum reef system

Module 5: Geostatistics for Ore Estimation

- Variography fundamentals
- Spatial continuity analysis
- Kriging methods
- Grade estimation techniques
- Uncertainty modelling
- **Case Study:** Nickel laterite grade estimation model

Module 6: Resource Classification Systems

- JORC & NI 43-101 standards
- Confidence level mapping
- Data density analysis
- Resource reporting protocols
- Risk classification models
- **Case Study:** Copper deposit resource classification audit

Module 7: Ore Boundary Delineation Techniques

- Grade shell modeling
- Cut-off grade determination
- Lithological boundary interpretation
- Contact modeling techniques
- Mineral zoning analysis
- **Case Study:** Gold-silver epithermal boundary delineation

Module 8: Remote Sensing in Exploration

- Satellite imagery interpretation
- Spectral analysis techniques
- Alteration mapping
- GIS integration workflows
- Drone survey applications
- **Case Study:** Lithium pegmatite detection using satellite data

Module 9: Geophysical Data Integration

- Magnetic survey interpretation
- Gravity anomaly mapping
- Resistivity profiling
- 3D geophysical inversion
- Integrated modelling
- **Case Study:** Iron ore anomaly delineation using magnetics

Module 10: Mineralization Systems Analysis

- Hydrothermal systems
- Magmatic processes
- Sedimentary ore systems
- Metamorphic mineralization
- Fluid flow modeling
- **Case Study:** VMS (Volcanogenic Massive Sulphide) system analysis

Module 11: Grade Control Techniques

- Blast hole sampling
- Ore/waste segregation
- Short-term mine planning
- Stockpile management
- Real-time grade tracking
- **Case Study:** Open-pit gold grade control optimization

Module 12: Machine Learning in Ore Delineation

- Predictive modeling
- Pattern recognition algorithms
- Clustering ore zones
- AI-based anomaly detection
- Data training workflows
- **Case Study:** AI-based gold prospectivity mapping

Module 13: Mine Planning Integration

- Pit optimization concepts
- Block modeling
- Scheduling strategies
- Ore blending optimization
- Production forecasting
- **Case Study:** Open-pit copper mine planning simulation

Module 14: Uncertainty and Risk Analysis

- Geological uncertainty modeling
- Monte Carlo simulations
- Sensitivity analysis
- Risk mapping techniques
- Decision-making frameworks
- **Case Study:** Uranium deposit risk evaluation model

Module 15: Sustainable Resource Development

- Environmental constraints
- Resource efficiency strategies
- Waste minimization
- ESG compliance in mining
- Rehabilitation planning
- **Case Study:** Sustainable coal mine rehabilitation 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	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

Ready to enroll or request a customized program? Book online or contact us:

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