Structural Controls on Mineralization 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

Structural Controls on Mineralization Training Course is designed to equip professionals with advanced skills in understanding how structural geology influences ore deposition and mineralizing systems. In modern mineral exploration, structural geology, tectonic frameworks, fault kinematics, and deformation analysis are critical drivers for targeting high-value deposits such as gold, copper, lithium, and rare earth elements. This course integrates cutting-edge exploration models with real-world geological datasets to improve predictive targeting and reduce exploration risk.

With increasing global demand for critical minerals, green energy metals, and high-grade ore bodies, understanding structural controls has become essential for successful resource discovery. Participants will explore how shear zones, folds, faults, fracture networks, and lithological contacts act as conduits or traps for mineralizing fluids. The training blends theory with applied exploration case studies from major mining districts worldwide, enabling professionals to build robust structural interpretation skills for both greenfield and brownfield exploration environments.

Programme Curriculum

Structural Controls on Mineralization Training Course

Introduction

Structural Controls on Mineralization Training Course is designed to equip professionals with advanced skills in understanding how structural geology influences ore deposition and mineralizing systems. In modern mineral exploration, structural geology, tectonic frameworks, fault kinematics, and deformation analysis are critical drivers for targeting high-value deposits such as gold, copper, lithium, and rare earth elements. This course integrates cutting-edge exploration models with real-world geological datasets to improve predictive targeting and reduce exploration risk.

With increasing global demand for critical minerals, green energy metals, and high-grade ore bodies, understanding structural controls has become essential for successful resource discovery. Participants will explore how shear zones, folds, faults, fracture networks, and lithological contacts act as conduits or traps for mineralizing fluids. The training blends theory with applied exploration case studies from major mining districts worldwide, enabling professionals to build robust structural interpretation skills for both greenfield and brownfield exploration environments.

Course Duration

5 days

Course Objectives

1. Master structural geology interpretation for mineral exploration targeting
2. Understand fault architecture and ore fluid pathways
3. Analyze shear zones and deformation regimes in ore genesis
4. Apply 3D structural modelling in mining geology
5. Identify litho-structural controls on gold and copper deposits
6. Evaluate tectonic settings of mineralized systems
7. Integrate geophysical data with structural mapping
8. Develop skills in kinematic analysis of faults and folds
9. Interpret hydrothermal alteration and structural traps
10. Use remote sensing for structural lineament analysis
11. Improve drill targeting using structural vectors
12. Understand ore shoot geometry and plunge controls
13. Apply AI-driven geological interpretation workflows

Target Audience

1. Exploration Geologists
2. Mining Geologists
3. Structural Geologists
4. Geophysicists in Mineral Exploration
5. Mining Engineers
6. Geological Consultants
7. Resource Modelers and 3D Modelling Specialists
8. Graduate Students in Earth Sciences

Course Modules

Module 1: Fundamentals of Structural Geology in Mineral Systems

- Stress-strain relationships in crustal deformation
- Types of faults, folds, and shear zones
- Brittle vs ductile deformation regimes
- Structural terminology for ore geology
- **Case Study:** Witwatersrand Basin gold structural framework (South Africa)

Module 2: Tectonic Settings and Mineralization Styles

- Plate tectonics and ore-forming environments
- Orogenic, magmatic, and extensional systems

- Structural evolution of ore provinces
- Basin and rift-related mineralization
- **Case Study:** Andean porphyry copper belt (Chile-Peru)

Module 3: Faults, Shear Zones, and Fluid Flow Systems

- Fault permeability and fluid migration
- Dilational jogs and ore deposition zones
- Shear zone-hosted gold systems
- Structural conduits for hydrothermal fluids
- **Case Study:** Abitibi Greenstone Belt gold deposits (Canada)

Module 4: Folding, Traps, and Ore Shoot Geometry

- Fold mechanisms and hinge zone enrichment
- Ore shoot plunge prediction
- Structural thickening zones
- Fold-fault interactions
- **Case Study:** Kalgoorlie Super Pit structural controls (Australia)

Module 5: Structural Mapping and Field Techniques

- Field mapping of deformation features
- Orientation data collection
- Structural cross-section construction
- Data integration from outcrop to deposit scale
- **Case Study:** Barberton Greenstone Belt mapping (South Africa)

Module 6: Geophysics and Structural Interpretation

- Magnetic and gravity anomaly interpretation
- Seismic structural imaging in mining
- Integration of geophysical datasets
- Lineament analysis and targeting
- **Case Study:** IOCG deposits in Olympic Dam (Australia)

Module 7: 3D Modelling and Mineral Targeting

- 3D geological modeling workflows
- Structural constraints in resource models
- Leapfrog and implicit modelling concepts
- Drill targeting optimization
- **Case Study:** Carlin-type gold system modeling (USA)

Module 8: Exploration Strategy and Predictive Targeting

- Structural vectoring for exploration success
- Prospectivity mapping techniques
- Integrated datasets for targeting decisions
- Risk reduction in exploration campaigns
- **Case Study:** Voisey’s Bay nickel deposit discovery model (Canada)

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

Start Date	End Date	Location	Price
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