Discontinuity 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

Discontinuity Mapping is a critical skill in engineering geology, rock mechanics, mining geotechnics, tunneling, slope stability analysis, and geohazard assessment. It involves the systematic identification, measurement, and interpretation of structural features such as joints, faults, fractures, bedding planes, shear zones, and rock mass fabric. These discontinuities control the mechanical behaviour, strength, permeability, and stability of rock masses, making accurate mapping essential for safe and cost-effective design in open-pit mining, underground excavations, civil infrastructure, and dam foundations.

Discontinuity Mapping Training Course is designed to equip participants with cutting-edge competencies in mining industries. Participants will gain hands-on experience in transforming raw field data into actionable engineering decisions for slope stability modelling, excavation design, rockfall hazard mitigation, and mine planning optimisation using industry-standard workflows and case-driven learning.

Programme Curriculum

Discontinuity Mapping Training Course

Introduction

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planning optimisation using industry-standard workflows and case-driven learning.

Course Duration

5 Days

Course Objectives

1. Master discontinuity characterization and rock mass classification (RMR, Q-System, GSI)
2. Apply advanced structural geology mapping techniques in field environments
3. Conduct accurate scanline and window mapping surveys
4. Interpret joint sets, fault systems, and fracture networks
5. Use stereonet analysis for geotechnical decision-making
6. Integrate LiDAR and drone-based photogrammetry in rock slope analysis
7. Perform kinematic analysis for slope failure prediction
8. Develop competency in rock mass stability and geohazard assessment
9. Apply GIS-based geotechnical data modelling
10. Conduct rock core logging and geotechnical logging standards
11. Build expertise in 3D geological modelling of discontinuities
12. Evaluate permeability and groundwater influence on rock stability
13. Design safe excavation and slope reinforcement strategies

Target Audience

1. Mining engineers (open-pit & underground)
2. Engineering geologists
3. Geotechnical engineers
4. Civil engineers in infrastructure projects
5. Rock mechanics specialists
6. Tunnel design engineers
7. Geological consultants
8. Environmental and geohazard specialists

Course Modules

Module 1: Fundamentals of Discontinuity Mapping

- Types of discontinuities: joints, faults, bedding planes
- Rock mass behaviour fundamentals
- Field mapping principles and standards
- Data recording techniques and field sheets
- Orientation measurement using compass-clinometer
- **Case Study:** Stability issues in fractured granite slope failure analysis

Module 2: Structural Geology for Engineering Applications

- Stress regimes and structural formation
- Identification of joint sets and fault kinematics
- Structural domain analysis
- Rock fabric interpretation
- Structural mapping in complex terrains
- **Case Study:** Tunnel collapse due to misinterpreted fault zone geometry

Module 3: Scanline & Window Mapping Techniques

- Scanline survey methodology
- Window mapping in exposed rock faces
- Sampling bias correction techniques
- Data density and spacing analysis
- Field documentation standards
- **Case Study:** Open-pit bench instability due to under-sampled joint sets

Module 4: Stereonet Analysis & Kinematic Modelling

- Plotting discontinuities on stereonets
- Kinematic failure analysis (planar, wedge, toppling)
- Friction angle and slope geometry integration
- Probability of failure assessment
- Software-assisted stereographic projection
- **Case Study:** Wedge failure in highway cut slope excavation

Module 5: Rock Mass Classification Systems

- RMR (Rock Mass Rating) system
- Q-System classification
- Geological Strength Index (GSI)
- Parameter weighting and adjustment
- Engineering interpretation for design
- **Case Study:** Underground mine stope design using RMR classification

Module 6: Digital Mapping Technologies (LiDAR, UAV, Photogrammetry)

- Drone-based geological mapping workflows
- LiDAR point cloud interpretation
- 3D surface reconstruction
- Digital outcrop modelling
- Integration with GIS platforms
- **Case Study:** Landslide hazard mapping using UAV photogrammetry

Module 7: Rock Slope Stability & Hazard Assessment

- Failure mechanisms in rock slopes
- Rockfall and debris modelling
- Water pressure influence
- Reinforcement techniques (bolts, mesh, shotcrete)
- Risk zoning and mitigation planning
- **Case Study:** Railway corridor rockfall mitigation project

Module 8: Advanced 3D Modelling & Geotechnical Integration

- 3D discontinuity modelling workflows
- GIS integration and spatial analysis
- Numerical modelling inputs (FLAC3D/RS3 concepts)
- Excavation design optimisation
- Mine planning integration

- **Case Study:** Open-pit slope redesign using 3D structural model

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:

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