Engineering Geology for Mining 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

Engineering Geology for Mining is a critical discipline that integrates geological science, geotechnical engineering, mineral exploration, rock mechanics, and mining safety management to support efficient and sustainable mineral extraction. With increasing global demand for critical minerals, sustainable mining practices, geohazard mitigation, and digital geotechnical modeling, engineering geology has become a cornerstone of modern mining operations. Engineering Geology for Mining Training Course emphasizes practical field-based understanding combined with laboratory analysis and digital tools such as GIS mapping, remote sensing, 3D geological modeling, and geotechnical software applications.

This training provides an industry-aligned pathway for professionals to master mine site investigation, geotechnical risk assessment, core logging, structural geology interpretation, and environmental geology compliance. Participants will gain hands-on exposure to real mining scenarios, enabling them to bridge the gap between theoretical geology and operational mining engineering. The program is structured to support mining engineers, geologists, geotechnicians, and project managers in enhancing productivity, safety, and operational efficiency in both surface and underground mining environments.

Programme Curriculum

Engineering Geology for Mining Training Course

Introduction

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Course Duration

5 days

Course Objectives

1. Understand engineering geology principles for modern mining systems
2. Apply rock mass classification systems (RMR, Q-System, GSI)
3. Conduct geotechnical site investigations for mining projects
4. Interpret structural geology for ore body modeling
5. Perform slope stability and landslide risk analysis
6. Evaluate groundwater flow and hydrogeological impacts
7. Use GIS and remote sensing in mineral exploration
8. Develop 3D geological and geotechnical models
9. Assess mining-induced seismicity and rockburst risks
10. Conduct core logging and drill hole data analysis
11. Apply mine safety and geohazard mitigation strategies
12. Integrate sustainable mining and environmental geology practices
13. Strengthen decision-making in mine design and planning

Target Audience

1. Mining Engineers
2. Engineering Geologists
3. Geotechnical Engineers
4. Exploration Geologists
5. Mine Surveyors
6. Project Managers in Mining Sector
7. Environmental Geologists
8. Graduate Students in Earth Sciences and Mining Engineering

Course Modules

Module 1: Fundamentals of Engineering Geology in Mining

- Rock types and mineral composition in mining environments
- Geological time scale and ore genesis
- Structural geology fundamentals
- Engineering properties of rocks and soils
- Geological mapping techniques
- **Case Study:** Copperbelt mining region geological mapping and ore zone identification

Module 2: Rock Mass Classification & Characterization

- RMR, Q-System, and GSI classification methods
- Discontinuity analysis and rock quality designation
- Field and laboratory rock testing methods
- Rock strength and deformability analysis
- Geotechnical logging standards
- **Case Study:** Rock mass stability assessment in deep gold mines

Module 3: Mining Geotechnical Site Investigation

- Borehole drilling and sampling techniques
- Core logging and geotechnical data recording
- Geophysical survey integration
- Subsurface modeling techniques
- Data interpretation for mine planning
- **Case Study:** Iron ore exploration site investigation and resource estimation

Module 4: Slope Stability and Surface Mining Safety

- Slope failure mechanisms and triggers
- Limit equilibrium and numerical methods
- Open pit slope design principles
- Landslide hazard monitoring systems
- Risk mitigation strategies
- **Case Study:** Open pit failure analysis in large-scale coal mining operations

Module 5: Underground Mining Geomechanics

- Stress distribution in underground excavations
- Rockburst and seismic hazard assessment
- Tunnel support systems design
- Pillar stability analysis
- Backfill and reinforcement strategies
- **Case Study:** Deep-level platinum mine rockburst mitigation strategy

Module 6: Hydrogeology in Mining Systems

- Groundwater flow modeling in mines
- Dewatering techniques and water control
- Aquifer contamination risks
- Pumping test analysis
- Mine water management systems
- **Case Study:** Dewatering system design in diamond mining operations

Module 7: GIS, Remote Sensing & Digital Geology

- Satellite imagery interpretation
- GIS-based mineral mapping
- 3D geological modeling tools
- UAV/drone mapping in mining
- Spatial data integration techniques
- **Case Study:** Remote sensing for gold exploration targeting zones

Module 8: Environmental & Sustainable Mining Geology

- Mine waste and tailings management
- Environmental impact assessment (EIA)
- Land rehabilitation and reclamation
- Acid mine drainage control
- ESG compliance in mining
- **Case Study:** Mine rehabilitation project in post-closure coal mine site

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