Advanced Geological Modelling 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

Advanced Geological Modelling Training Course is designed to equip geoscientists, petroleum engineers, mining professionals, and earth science researchers with advanced competencies in 3D geological modelling, reservoir characterization, structural interpretation, stratigraphic analysis, and geospatial data integration. This training emphasizes the use of modern digital tools and workflows such as Petrel, Leapfrog, GIS platforms, AI-driven geomodelling, and machine learning in geoscience, enabling participants to build highly accurate subsurface models for exploration, production, and resource optimization. With increasing global demand for energy transition modelling, carbon capture storage (CCS) modeling, and mineral exploration analytics, this course bridges the gap between traditional geology and next-generation computational earth sciences.

This program integrates practical and theoretical learning to strengthen expertise in seismic interpretation, petrophysical modeling, facies modelling, reservoir simulation, and uncertainty quantification. Participants will gain hands-on experience in building integrated geological frameworks that support decision-making in oil & gas exploration, mining feasibility studies, groundwater modeling, and environmental geology assessments. The course is designed to align with global industry standards, promoting skills in data-driven geoscience, digital twin earth modeling, and predictive geological analytics, ensuring professionals are fully prepared for modern geoscience challenges

Programme Curriculum

Advanced Geological Modelling Training Course

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10 Days

Course Objectives

1. Master advanced 3D geological modelling workflows using industry-standard software
2. Develop expertise in reservoir characterization and static modelling techniques
3. Apply seismic interpretation and structural geology analysis in real-world datasets
4. Integrate petrophysical data and well log interpretation into geological models
5. Build competency in facies modelling and stratigraphic correlation techniques
6. Understand geostatistics and spatial data analysis for geoscience applications
7. Implement AI and machine learning in geological prediction and modelling
8. Perform uncertainty quantification and risk analysis in subsurface modelling
9. Design integrated petroleum system models for exploration workflows
10. Apply GIS-based geospatial analysis for geological mapping
11. Develop skills in mineral exploration modelling and resource estimation
12. Utilize reservoir simulation data integration techniques
13. Build professional capability in digital twin earth systems and predictive geology

Target Audience

1. Petroleum Geologists & Reservoir Engineers
2. Mining Engineers & Mineral Exploration Geologists
3. Geophysicists & Seismic Interpretation Specialists
4. Environmental Geologists & Hydrogeologists
5. GIS Analysts & Remote Sensing Professionals
6. Energy Sector Data Scientists & Modelling Experts
7. Academic Researchers in Earth Sciences
8. Graduate Students in Geology, Geophysics & Geoscience

Course Modules

Module 1: Fundamentals of Geological Modelling

- Earth system science principles
- Subsurface data types and integration

- Geological time scale application
- Model building concepts
- Industry workflows overview
- **Case Study:** Basic reservoir model construction in a sandstone formation

Module 2: 3D Geological Modelling Software Tools

- Petrel/Leapfrog introduction
- Data import/export workflows
- Surface and volume modelling
- Model visualization techniques
- Software comparison analysis
- **Case Study:** 3D structural model of a hydrocarbon field

Module 3: Structural Geology & Fault Modelling

- Fault system interpretation
- Structural framework building
- Horizon mapping techniques
- Deformation analysis
- Tectonic modelling
- **Case Study:** Faulted reservoir modeling in a rift basin

Module 4: Stratigraphic Framework Development

- Sequence stratigraphy concepts
- Correlation techniques
- Depositional environment analysis
- Stratigraphic surfaces creation
- Time-to-depth conversion
- **Case Study:** Deltaic system stratigraphic reconstruction

Module 5: Seismic Interpretation Techniques

- Seismic data fundamentals
- Horizon picking methods
- Fault interpretation
- Attribute analysis
- Seismic inversion basics
- **Case Study:** Offshore seismic reservoir identification

Module 6: Petrophysical Analysis Integration

- Well log interpretation
- Lithology identification
- Porosity & permeability estimation
- Fluid saturation analysis
- Core data integration
- **Case Study:** Carbonate reservoir evaluation

Module 7: Facies Modelling Techniques

- Facies classification systems
- Stochastic modelling approaches
- Variogram analysis
- Spatial distribution modelling
- Geological uncertainty handling
- **Case Study:** Fluvial channel reservoir modelling

Module 8: Geostatistics in Geological Modelling

- Kriging methods
- Variogram modelling
- Spatial interpolation techniques
- Statistical distribution analysis
- Data conditioning
- **Case Study:** Mineral grade distribution model

Module 9: Reservoir Characterization

- Static model building
- Rock property modeling
- Fluid flow behavior basics
- Reservoir zonation
- Integration of multidisciplinary data
- **Case Study:** Tight gas reservoir characterization

Module 10: Reservoir Simulation Integration

- Dynamic modelling basics
- Pressure and flow simulation
- History matching concepts
- Forecasting production trends
- Model calibration
- **Case Study:** Mature oil field production optimization

Module 11: GIS & Remote Sensing Applications

- Spatial mapping techniques
- Satellite data interpretation
- Terrain analysis
- Geospatial data layers
- Environmental monitoring
- **Case Study:** Groundwater contamination mapping

Module 12: Mineral Exploration Modelling

- Ore deposit modelling
- Resource estimation methods
- Geological mapping integration
- Geochemical anomaly analysis
- Exploration targeting
- **Case Study:** Gold deposit modelling in greenstone belts

Module 13: Uncertainty & Risk Analysis

- Probabilistic modelling
- Sensitivity analysis
- Monte Carlo simulations
- Data uncertainty quantification
- Decision risk frameworks
- **Case Study:** Exploration risk assessment in offshore basin

Module 14: AI & Machine Learning in Geology

- Predictive modelling techniques
- Pattern recognition in geology
- Neural networks for subsurface data
- Data clustering methods
- Automation in interpretation
- **Case Study:** AI-based lithology classification

Module 15: Digital Twin Earth & Advanced Applications

- Digital earth modelling concepts
- Real-time data integration
- Smart geological systems
- Carbon capture storage modelling
- Future exploration technologies
- **Case Study:** CCS site modelling for carbon sequestration

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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