Exploration Project Evaluation & Investment Risk Analysis 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

Exploration Project Evaluation & Investment Risk Analysis Training Course is meticulously engineered to equip industry professionals with the advanced framework necessary to navigate complex asset portfolios. By integrating cutting-edge geostatistical modeling, stochastic resource estimation, and fiscal regime analysis, participants will transition from traditional deterministic approaches to robust, data-driven decision-making paradigms. The curriculum emphasizes the synthesis of subsurface uncertainty with commercial realities, ensuring that capital allocation aligns with corporate risk tolerances and macroeconomic shifts.

Accelerating technological disruptions, such as AI-driven predictive analytics and machine learning-enhanced seismic inversion, are redefining the risk-reward calculus of modern exploration. This course bridges the gap between raw geological data and boardroom-ready investment strategies by utilizing state-of-the-art Monte Carlo simulations, Value of Information (VOI) metrics, and Real Options Analysis (ROA). Attendees will dissect complex fiscal frameworks, model carbon-tax implications, and stress-test portfolios against severe market volatility. Ultimately, this program establishes a benchmark for evaluating high-stakes exploration projects, transforming geological uncertainties into quantifiable, strategic corporate advantages.

Programme Curriculum

Exploration Project Evaluation & Investment Risk Analysis Training Course

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Course Duration

10 Days

Course Objectives

1. Quantify Subsurface Uncertainty.
2. Execute Risk-Adjusted Valuations.
3. Master Monte Carlo Workflows.
4. Evaluate Global Fiscal Regimes
5. Implement Real Options Analysis (ROA.
6. Optimize Portfolio Capital Allocation.
7. Conduct Value of Information (VOI) Analysis
8. Integrate ESG and Carbon Pricing.
9. Leverage AI and Predictive Analytics.
10. Mitigate Cognitive Biases.
11. Perform Advanced Sensitivity Testing
12. Formulate Strategic Farm-out Structures.
13. Deliver Executive-Level Investment Pitches.

Target Audience

- Exploration Managers & Directors.
- Chief Geologists & Geophysicists.
- Reservoir Engineers
- Investment Bankers & Energy Equity Analysts.
- New Ventures & Business Development Managers.
- Corporate Financial Officers & Economists.
- State-Owned Oil Company (NOC) Executives.
- ESG Compliance Officers & Risk Managers.

Course Modules

Module 1: Subsurface Volumetric Analysis & Resource Classification

- Volumetric calculations using deterministic vs. probabilistic distributions.
- Application of the **Petroleum Resources Management System** and SEC disclosure standards.
- Gross Rock Volume determination via advanced net-to-gross and porosity cut-off workflows.
- Fluid saturation modeling and hydrocarbon formation volume factors uncertainties.

- *Case Study:* Mapping structural uncertainty and recalculating volumes for a faulted deepwater turbidite reservoir in the **Gulf of Mexico**.

Module 2: Geological Risking & Chance of Success Assessment

- Deconstruction of the exploration risk matrix: Source, Migration, Reservoir, Trap, and Seal presence.
- Statistical calibration of play fairway maps using **Common Risk Segment** mapping.
- Quantifying shared vs. independent risk components in multi-prospect exploration clusters.
- Application of Bayesian workflows to update post-appraisal well results.
- *Case Study:* Re-evaluating risk factors for a pre-salt carbonate play in the **Santos Basin, Brazil** following a string of sub-commercial discoveries.

Module 3: Advanced Cash Flow Modeling & Fiscal Regimes

- Constructing granular upstream economic models from exploration capital expenditure to decommissioning expenditure.
- Economic modeling of Concessionary/Royalty-Tax systems vs. **Production Sharing Contracts (PSCs)**.
- Mechanics of cost recovery caps, profit oil splits, and state equity participation clauses.
- Incorporating windfall taxes, R-factor mechanisms, and ring-fencing constraints.
- *Case Study:* Comparative economic modeling of a marginal field development under **UK North Sea** fiscal terms vs. **Angolan** deepwater PSCs.

Module 4: Monte Carlo Simulations in Asset Valuation

- Setting up dependency structures and **Rank Correlation Coefficients** between geological inputs
- Simulating correlated variables to prevent unrealistic volumetric combinations in exploration prospects.
- Interpreting cumulative probability distribution curves (S-curves) for production forecasting.
- Identifying key value drivers using stochastic regression and sensitivity coefficients.
- *Case Study:* Running a 10,000-iteration simulation for a frontier gas prospect in the **East African Rift System** using specialized economic software.

Module 5: Discounted Cash Flow (DCF) & Risk-Adjusted Investment Metrics

- Calculating Weighted Average Cost of Capital (WACC) and choosing appropriate hurdle rates for frontier vs. mature basins.
- Limitations of standard NPV/IRR metrics in highly uncertain, phased exploration projects.
- Derivation and execution of **Expected Monetary Value (EMV)** for binary and multi-outcome decision trees.
- Calculating Growth Western/Internal Rate of Return and Capital Efficiency Factors.
- *Case Study:* Choosing between three competing exploration licenses in the **Guyana-Suriname Basin** using EMV rankings under constrained capital budgets.

Module 6: Value of Information (VOI) & Appraisal Strategy

- Formulating the mathematical foundation of VOI using imperfect vs. perfect information matrices.
- Designing appraisal campaigns: Optimizing the number and location of appraisal wells.
- Economic justification of high-density 3D/4D seismic acquisition vs. immediate drilling.
- Bayesian updating of trap and reservoir compartmentalization risks through drill-stem test (DST) data.
- *Case Study:* Evaluating whether to acquire a $40M multi-client 3D seismic survey over an un-drilled block in the **NW Shelf of Australia**.

Module 7: Real Options Analysis (ROA) in Exploration

- Applying the Black-Scholes and Binomial Option Pricing Models to upstream assets.
- Valuing the **Option to Defer** development in a depressed commodity price environment.
- Quantifying the financial upside of the **Option to Expand** discovery sizing via step-out drilling.
- Valuing abandonment, suspension, and strategic pilot-project options.
- *Case Study:* Valuing a 5-year exploration license extension option in an Arctic play with volatile global oil price assumptions.

Module 8: Portfolio Optimization & Capital Allocation

- Applying **Markowitz Mean-Variance Optimization** to exploration and production portfolios.
- Balancing high-risk/high-reward frontier acreage with low-risk/low-reward infill infrastructure-led exploration.
- Resource constraints modeling: Headcount, rig availability, and capital limits.
- Diversification strategies across varying geopolitical zones and asset types.
- *Case Study:* Rebalancing a mid-cap E&P company's asset portfolio across **West Africa** and the **US Permian Basin** to maximize capital efficiency.

Module 9: Corporate Strategy, Joint Ventures & Farm-outs

- Structuring farm-in/farm-out agreements: Promotes, carries, and back-in rights.
- Joint Operating Agreement (JOA) negotiations: Voting thresholds, sole risk clauses, and non-consent penalties.
- Strategic alignment between National Oil Companies and International Oil Companies.
- Mechanics of overriding royalty interests and net profit interests.
- *Case Study:* Negotiating a farm-out deal for a capital-intensive deepwater block in the **Eastern Mediterranean**, optimizing the carry structure.

Module 10: Energy Transition, Carbon Risk & ESG Integration

- Quantifying shadow carbon pricing and its impact on the economic limit of mature assets.
- Modeling greenhouse gas emissions footprints per barrel of oil equivalent.
- Evaluating the economics of integrating Carbon Capture, Utilization, and Storage (CCUS) into gas field developments.
- Assessing the impact of ESG ratings on debt financing costs and equity risk premiums.
- *Case Study:* Stress-testing a heavy oil project development in **Western Canada** against a $150/tonne escalating carbon tax scenario.

Module 11: Unconventional Play Evaluation (Shale, Tight Gas, Coalbed Methane)

- Contrasting risk profiles: Continuous accumulations vs. discrete conventional prospects.
- Evaluating decline curve analysis variations for multi-stage fractured wells.
- Acreage sweet-spotting using geomechanical, total organic carbon, and thermal maturity indicators.
- Pad-drilling economics, infrastructure constraints, and supply chain logistics optimization.
- *Case Study:* Economic optimization and spacing design for a 24-well pad development in the **Vaca Muerta** formation, Argentina.

Module 12: Machine Learning & AI in Exploration Economics

- Using automated machine learning (AutoML) for rapid play fairway and prospect screening.
- AI-enhanced seismic interpretation: Impacts on reducing structural interpretation cycle times and costs.
- Data-driven predictive analytics for forecasting drilling time-depth curves and rig non-productive time.

- Natural Language Processing applications for scanning regional regulatory and historical well reports.
- *Case Study:* Deploying predictive algorithms to rank 200 legacy prospects in a mature basin in the **Java Sea**, reducing screening time by 80%.

Module 13: Geopolitical Risk, Contractual Stability & Price Hedging

- Quantifying expropriation risk, civil unrest, and regulatory instability in frontier regions.
- Structuring production hedges using swaps, collars, and three-way options to protect exploration cash flows.
- Evaluating bilateral investment treaties and international arbitration clauses in host government contracts.
- Managing currency convertibility, remittance restrictions, and local content compliance costs.
- *Case Study:* Formulating a multi-layered risk mitigation and hedging strategy for an independent E&P operator entering a complex **North African** jurisdiction.

Module 14: Gas & LNG Project Evaluation

- Analyzing global gas pricing mechanics: Henry Hub, TTF, JKM, and oil-indexed formulas.
- Evaluating pipeline export infrastructure economics vs. LNG liquefaction and shipping chains.
- Domestic market obligations and their dilutive impact on project economics.
- Assessing takeaway capacity, processing tariffs, and continuous contractual take-or-pay structures.
- *Case Study:* Financial structuring and market risk evaluation for an integrated LNG export terminal project in **Northern Australia**.

Module 15: Capstone: Integrated Asset Evaluation & Peer Challenge

- Comprehensive data package synthesis: 3D seismic interpretation notes, log data, and regional fiscal terms.
- Probabilistic volumetric calculation and structural cross-section verification.
- Full development economic modeling with variable CAPEX, OPEX, and carbon tax curves.
- Strategic investment presentation preparation including complete EMV and portfolio-fit analysis.
- *Case Study:* Live simulation where participant teams defend a $150M deepwater exploration bid proposal before an executive "Investment Committee" panel.

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

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