

SEISMIC INTERPRETATION AND PETROLEUM PROSPECT EVALUATION

Cairo - Egypt
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\$5,500



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TRAINING CENTER



Introduction

Seismic Interpretation and Petroleum Prospect Evaluation Training Course builds the full chain of skills that turns raw seismic data into a drillable prospect. Exploration value depends on correct acquisition, careful processing, and disciplined interpretation, yet many teams master one link and leave the others weak. This course connects all of them. It begins with rock physics, wave propagation, and acquisition methods. Furthermore, it covers the processing workflow, well-to-seismic calibration, and quantitative interpretation techniques. In addition, it develops structural and stratigraphic interpretation, then closes with petroleum systems, volumetrics, and geological risking. As a result, participants evaluate prospects on evidence rather than optimism.

Seismic Interpretation and Petroleum Prospect Evaluation Course Objectives

- Explain the history of seismic exploration and its role in petroleum evaluation.
- Apply rock physics and elastic property concepts to seismic response.
- Describe wave propagation, reflection, refraction, impedance, and reflectivity.
- Compare land and marine seismic acquisition methods and their trade-offs.
- Interpret gravity, magnetic, and electromagnetic survey data alongside seismic.
- Trace the seismic processing workflow from pre-stack to migration.
- Perform well-to-seismic calibration using checkshots and synthetic seismograms.
- Interpret horizons, faults, and structural styles on 2D and 3D data.
- Apply AVO, seismic inversion, and spectral decomposition techniques.
- Apply seismic sequence stratigraphy and Wheeler diagram analysis.
- Evaluate petroleum system elements from source rock to trap and timing.
- Calculate STOIIP and GIIP and apply P10, P50, P90 and Mean estimates.
- Apply geological risking methods including Chance of Success and Probability of Success.



Course Methodology

- Interactive lectures supported by real seismic sections and well data.
- Workstation-based horizon and fault interpretation exercises.
- Synthetic seismogram generation and well-to-seismic calibration practice.
- AVO, inversion, and attribute analysis workshops on sample datasets.
- Volumetric calculation and risking exercises on a worked prospect.
- Structured peer review with facilitator feedback on interpretation decisions.

Who Should Take This Course

- Geoscientists and seismic interpreters.
- Exploration and appraisal geologists.
- Geophysicists working on acquisition and processing projects.
- Petrophysicists supporting reservoir characterisation.
- Reservoir engineers involved in volumetric estimation.
- Exploration managers and new ventures analysts.
- Professionals evaluating leads, prospects, and exploration portfolios.

Seismic Interpretation and Petroleum Prospect Evaluation Course Outlines

Day 1: Seismic Fundamentals, Acquisition, and Processing

- History of seismic exploration and its role in exploration.

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- Rock physics, elastic properties, and acoustic response.
- Wave propagation, reflection, refraction, impedance, and reflectivity.
- Land and marine seismic acquisition methods.
- Gravity, magnetic, and electromagnetic methods alongside seismic.
- Pre-stack processing, CMP gathers, post-stack processing, and migration.
- Velocity modelling and well-to-seismic calibration using checkshots, sonic logs, synthetic seismograms, and Vertical Seismic Profiles (VSP).

Day 2: 2D and 3D Seismic Interpretation Basics

- 2D and 3D seismic datasets and their uses.
- Seismic polarity conventions and their interpretation impact.
- Visualisation techniques, vertical exaggeration, and slice views.
- Seismic data management and licensing considerations.
- Interpretation software workflows and project setup.
- Hard and soft seismic events and their geological meaning.
- Quantitative interpretation: acoustic impedance, seismic inversion, AVO, RMS amplitude, and spectral decomposition.

Day 3: Structural Interpretation

- Fault identification, correlation, and mapping.
- Structural styles: rift basins, compressional systems, salt tectonics, and strike-slip systems.
- 2D fault interpretation techniques.
- 3D fault interpretation and fault plane building.
- Structural modelling and visualisation of trap geometry.
- Geodynamics and kinematics of basin evolution.
- Palinspastic restoration and structural validation.





Day 4: Stratigraphic Interpretation

- Horizon interpretation workflows and horizon attributes.
- Continuity analysis and lateral facies changes.
- Unconformities and stratal termination patterns.
- Seismic facies analysis and facies mapping.
- Carbonate seismic facies and their diagnostic characters.
- Siliciclastic seismic facies and depositional environments.
- Wheeler diagrams and seismic sequence stratigraphy.

Day 5: Petroleum Systems, Volumetrics, and Risking

- Petroleum system elements: source rock, reservoir, seal, and trap.
- Timing and migration pathways.
- Hydrocarbon mapping of structural, stratigraphic, and combination traps.
- STOIP and GIIP volumetric concepts.
- Resource and reserve estimation, leads, and prospects.
- P10, P50, P90 and Mean estimate application.
- Geological risking: Chance of Success, Probability of Success, and risk in economics.



Conclusion

By successfully completing Seismic Interpretation and Petroleum Prospect Evaluation, participants will gain a thorough understanding of seismic acquisition and processing, well-to-seismic calibration, structural and stratigraphic interpretation, quantitative interpretation techniques, petroleum system analysis, volumetric estimation, and geological risking. They will also acquire practical skills in horizon and fault interpretation, seismic attribute and inversion analysis, prospect volumetric calculation, and chance-of-success assessment. In addition, the course prepares them to evaluate exploration opportunities with disciplined, evidence-based judgement. Gentex Training Center delivers this programme with a strong focus on applied interpretation practice and defensible prospect evaluation.

FAQs for Seismic Interpretation and Petroleum Prospect Evaluation course

Q1 What is the "Seismic Interpretation and Petroleum Prospect Evaluation" course about?

It is a five-day programme that follows the path from seismic data to a drillable prospect. It covers rock physics, acquisition and processing, well-to-seismic calibration, 2D and 3D interpretation, structural and stratigraphic analysis, petroleum systems, volumetrics, and geological risking.



Q2 What are the key benefits of the "Seismic Interpretation and Petroleum Prospect Evaluation" course?

Participants interpret with more confidence and evaluate prospects with more discipline. The course improves structural and stratigraphic accuracy, connects seismic response to rock properties, sharpens volumetric estimates and range reporting, standardises risking so prospects compare fairly, and reduces the chance of drilling a target that the data never supported.

Q3 What skills will I gain from the "Seismic Interpretation and Petroleum Prospect Evaluation" course?

Participants gain seismic interpretation and well-to-seismic calibration, structural and stratigraphic interpretation, quantitative interpretation using AVO, inversion and seismic attributes, and volumetric estimation and geological risking. These four skills cover the practical core of prospect evaluation.



Q4 What tools, methods, or standards are covered in the "Seismic Interpretation and Petroleum Prospect Evaluation" course?

The course covers rock physics and elastic property analysis, wave propagation, reflection, refraction, impedance and reflectivity concepts, land and marine acquisition methods, gravity, magnetic and electromagnetic surveys, pre-stack processing, CMP gathers, post-stack processing, migration and velocity modelling, checkshots, sonic logs, synthetic seismograms, Vertical Seismic Profiles, seismic polarity conventions, horizontal and vertical slice analysis, horizon interpretation and horizon attributes, acoustic impedance, seismic inversion, AVO analysis, RMS amplitude, spectral decomposition, fault identification and fault plane building, structural styles including rift, compressional, salt tectonic and strike-slip systems, palinspastic restoration, seismic facies analysis for carbonate and siliciclastic systems, Wheeler diagrams, seismic sequence stratigraphy, petroleum system elements analysis, STOIP and GIIP calculation, P10, P50, P90 and Mean estimation, Chance of Success and Probability of Success risking methods, and risk integration into economics.

Q5 How is the "Seismic Interpretation and Petroleum Prospect Evaluation" course applied in real-world practice?

Participants apply the methods to real datasets. They tie wells to seismic, pick horizons and faults, build structural and stratigraphic frameworks, run attribute and inversion analyses, map trap geometry, calculate volumes across a probability range, assign Chance of Success, and feed the result into an economic evaluation. Many leave with a calibrated interpretation workflow, a volumetric template, and a risking matrix ready for their next prospect review.