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COURSE BROCHURE

# Advanced Seismic Interpretation Training Course

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Registered in the United Kingdom and Saudi Arabia

# Advanced Seismic Interpretation Training Course

Seismic Interpretation is a 2-week training course for geophysicists and exploration geoscientists who map structures, stratigraphy and fluids from 2D and 3D seismic volumes, and each participant assembles a prospect and reservoir interpretation dossier. Mature basins, subtle traps and denser data volumes now reward interpreters who combine attributes, AVO and robust depth models. Jupiter Prime Training delivers Seismic Interpretation for exploration and development geoscientists.

## Why Seismic Interpretation Matters Now

Three forces shape interpretation work today. Remaining prospects are smaller and more subtle, so stratigraphic traps and amplitude anomalies matter more than obvious anticlines. Broadband acquisition, reprocessed volumes and machine-assisted picking deliver more data than interpreters can review by eye. Asset partners, reserves auditors and drilling teams expect volumes and risks they can trace back to the seismic. A team that interprets well drills fewer dry holes and places development wells accurately; one that does not loses capital on poorly constrained targets. The course draws on amplitude versus offset AVO analysis, seismic attribute workflows and the Society of Petroleum Engineers Petroleum Resources Management System SPE PRMS for prospect volumes.

## Who Gains Most from Seismic Interpretation

- Geophysicists who pick horizons and faults and build time and depth maps
- Exploration geoscientists who generate and risk prospects for drilling portfolios
- Development geologists who use seismic to steer well placement and reservoir models
- Quantitative interpreters who run attribute, AVO and inversion studies
- Subsurface leads who review interpretations before partner and investment meetings

Exploration and subsurface departments gain most when geophysicists and geologists attend together and agree one interpretation workflow from well tie to prospect volume.

## Seismic Interpretation Capabilities

Participants move from picking reflections to building defensible subsurface pictures that drilling, reserves and investment decisions can rest on.

- Build synthetic seismograms and well ties for a 3D survey — horizon identification confidence
- Design structural and stratigraphic maps from 2D and 3D data — prospect delineation
- Apply seismic attributes and AVO analysis to predict lithology and fluids — drilling target selection
- Calculate depth conversion with velocity models and uncertainty ranges — well planning and volumes
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Assess prospect risk and volumetrics consistent with SPE PRMS — exploration portfolio ranking
- Communicate interpretation results to drilling and reservoir teams — development decisions

## Key Seismic Interpretation Terms

- Well tie — matching seismic reflections to well logs through a synthetic seismogram so horizons carry geological meaning.
- Seismic attribute — a measurement derived from seismic data, such as amplitude or coherence, that highlights geological features.
- AVO — amplitude versus offset, the change in reflection strength with source-receiver distance used to infer rock and fluid type.
- Depth conversion — transforming seismic time maps into depth using velocity models calibrated to wells.
- Direct hydrocarbon indicator — a seismic anomaly, such as a bright spot or flat spot, suggesting gas or oil presence.
- Seismic inversion — converting reflection data into rock property volumes such as acoustic impedance.

## Seismic Interpretation Day by Day

## Day 1: Seismic Data and Its Limits

- Acquisition Geometry for 2D and 3D Surveys — Data Fitness for Purpose
- Processing Sequence and Migration Effects — Imaging Pitfalls
- Vertical and Lateral Resolution Limits — Thin Bed Detection
- Seismic Polarity and Phase Conventions — Consistent Picking
- Data Loading and Quality Control — Interpretation Readiness

## Day 2: Well Ties and Seismic Stratigraphy

- Synthetic Seismogram Generation — Horizon Identification
- Wavelet Extraction and Phase Matching — Tie Quality
- Seismic Facies Recognition — Depositional Environment Clues
- Sequence Stratigraphy Surfaces on Seismic — Reservoir Distribution
- Chronostratigraphic Framework Building — Regional Correlation

## Day 3: Structural Interpretation

- Fault Picking and Fault Framework Modelling — Trap Geometry
- Extensional, Compressional and Salt Structure Styles — Play Recognition
- Time Structure Mapping and Gridding — Closure Definition
- Fault Seal Analysis Concepts — Trap Integrity Risk
- Structural Restoration Checks — Interpretation Validity

## Day 4: Stratigraphic and Subtle Traps

- Pinch-Out and Onlap Mapping — Stratigraphic Trap Delineation
- Channel and Fan System Interpretation — Reservoir Geometry
- Carbonate Build-Up Recognition — Porosity Sweet Spots
- Unconformity Trap Analysis — Seal and Reservoir Juxtaposition
- Horizon Slicing and Proportional Slicing — Facies Mapping

## Day 5: Seismic Attributes

- Amplitude and RMS Attribute Extraction — Reservoir Presence
- Coherence and Curvature Volumes — Fault and Fracture Detection
- Spectral Decomposition — Thin Bed and Channel Imaging
- Multi-Attribute Classification — Facies Prediction
- Machine-Assisted Fault and Horizon Picking — Interpretation Speed

## Day 6: AVO and Rock Physics

- Rock Physics Templates and Fluid Substitution — Expected Responses
- AVO Classes and Intercept-Gradient Analysis — Fluid Discrimination
- Direct Hydrocarbon Indicator Validation — False Positive Avoidance
- Pre-Stack Gather Conditioning — Reliable AVO Inputs
- Elastic Inversion Overview — Lithology and Porosity Volumes

## Day 7: Velocity Models and Depth Conversion

- Velocity Sources From Wells and Seismic — Model Inputs
- Layer-Cake and Gridded Velocity Models — Method Selection
- Depth Conversion Uncertainty Ranges — Closure Robustness
- Depth Error Impact on Well Targets — Drilling Risk
- Time-Depth Ties for New Wells — Model Updating

## Day 8: Prospect Generation and Risking

- Play Fairway Mapping — Exploration Focus Areas
- Prospect Volumetrics With Probabilistic Inputs — Resource Ranges
- Geological Chance of Success Assessment — Risk Consistency
- SPE PRMS Prospective Resource Classification — Portfolio Reporting
- Prospect Inventory Ranking — Drilling Sequence Decisions

## Day 9: Reservoir Characterisation for Development

- Seismic-Guided Reservoir Property Mapping — Static Model Inputs
- 4D Time-Lapse Seismic Concepts — Fluid Movement Monitoring
- Well Placement Using Seismic Constraints — Infill Targets
- Seismic for Carbon Storage and Geothermal Sites — Wider Subsurface Uses
- Integration With Reservoir Engineering Data — Development Plans

## Day 10: Practising the Prospect and Reservoir Interpretation Dossier

- Well Tie and Framework From Days 2 and 3 — Interpretation Foundation
- Attribute and AVO Evidence From Days 5 and 6 — Fluid Case
- Depth Model From Day 7 — Target Depth Ranges
- Peer Review of Risk and Volumes — Assumption Challenge
- Completing the Prospect and Reservoir Interpretation Dossier — Drill or Defer Proposal

## Applying Seismic Interpretation After the Course

- Re-tie two key wells with new synthetic seismograms and update the horizon framework where ties shift.
- Run an AVO and attribute review on one prospect and present the fluid evidence with explicit risk to the exploration lead.

## Seismic Interpretation Questions FAQ

### What is Seismic Interpretation and why does it matter now?

Seismic Interpretation turns 2D and 3D seismic data into maps of structures, reservoirs and fluids. It matters now because remaining prospects are subtle and drilling budgets demand well-constrained targets.

### Which roles gain most from Seismic Interpretation training?

Geophysicists and exploration geoscientists gain most, along with development geologists, quantitative interpreters and subsurface leads who review interpretations before investment meetings.

### How does advanced Seismic Interpretation differ from a general exploration and production course?

It works at interpreter depth rather than overview level. You build well ties, attribute and AVO studies, velocity models and risked prospect volumes instead of surveying the whole upstream chain.

### What do you bring back from Seismic Interpretation training?

You bring back an interpretation dossier for a prospect or reservoir, linking framework, attributes, depth model and risked volumes into a drill or defer proposal.

## Seismic Interpretation: The Way Forward

The prospect and reservoir interpretation dossier first informs whether a target enters the drilling sequence. Geophysicists, geologists and asset leads use it to agree risk and volumes with partners. After the next well results, the velocity model and AVO calibration deserve another look, because each new well tests the assumptions behind them.