

GEOPHYSICS

GUIDED WORK EXPERIENCES



PetroSkills Guided Work Experiences (GWEs) enable technical professionals to deliver a tangible work product through specific deliverables and performance measures. GWEs have been developed by industry experts and deliver the on-the-job connection between knowledge and action.

Principles of Wave Propagation

- Attributes of Seismic Wavelet: Amplitude, Wavelength, Frequency, Phase, Velocity
- Fundamental Principles Governing Wave Propagation: Snell's Law, Huygen's Principle, Fermat's Principle
- Factors Effecting Wave Types: P, S, and Multi-Component Recording of Waves
- Representation of Seismic Data in Various Domains
- Differentiating Noise From Signal
- Wave Propagation Theory (Wave Fronts, Reflections, Refractions and Diffractions, and Fresnel Zone)
- Ray Theory (Ray Paths, Reflections, Refractions and Diffractions)

General Seismic Interpretation

- Data Management
- Mapping
- Structural Mapping
- Attribute Applications
- Inversion
- AVO - V_p/V_s
- Seismic Modeling
- 1D Well Log Synthetic Generation and Correlation
- Seismic Indications of Overpressure
- High Resolution Seismic Applications
- 3D Interpretation-Visualization
- Rock Properties Determination From Acoustic Response
- Velocities and Depth Conversion
- Azimuthal Travel times
- Integrated Interpretation of Unconventional Reservoirs
- Geomechanics & Fracture Mechanics

Acquisition

- Basic Survey Design
- Survey Geometry Design
- Sources, Receivers, and Recording Instruments
- Land Acquisition
- Marine Acquisition
- Transition-Zone Acquisition
- Shallow High-Resolution Acquisition
- Acquisition Planning and Execution

Processing

- Processing Preparation
- Relative Amplitude Recovery
- 1D Filtering Band Pass Filtering
- 2D and 3D Filtering F-K Filtering
- Deconvolution TAU-P Filtering
- Velocity Effects in Processing
- Deconvolution
- NMO and Mute
- Statics
- Stacking
- Multiples
- DMO
- Migration
- Pre-Stack Depth Migration
- Multi-Component Processing
- Planning and Execution



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Seismic Stratigraphic Interpretation

- Seismic (Vail) Sequence Analysis
- Depositional (Galloway) Sequence Analysis
- Clastic Seismic Facies Analysis
- Carbonate Seismic Facies Analysis
- Salt and Evaporite Seismic Facies Analysis
- Chronostratigraphy
- Sea Level Curve Analysis
- Geohistory Reconstruction
- Reservoir Characterization

Borehole and Non-seismic Geophysics

- Sonic Logging
- Vertical Seismic Profiles
- Cross-Well Tomography
- Electromagnetics and Nuclear Physics
- Magnetics Analysis
- Gravity Analysis
- Micro-seismic Fracture Mapping
- Geosteering