

# RESERVOIR GEOPHYSICS



**DRPT102 Drilling,  
Reservoir &  
Petroleum  
Training**

**COURSE TITLE****RESERVOIR GEOPHYSICS****COURSE DATE/ VENUE**

02<sup>nd</sup> – 06<sup>th</sup> Feb 25'

London, UK

**COURSE REFERENCE**

DRPT102

**COURSE DURATION**

05 days

**DISCIPLINE**

Drilling, Reservoir & Petroleum Training

**COURSE INTRODUCTION**

Reservoir characterization involves the understanding and methods used to characterize reservoir heterogeneity. This course provides a special focus on reservoir properties in constructing realistic 3D images of its geological and petrophysical properties. The course covers an extensive amount of case studies from various geological fields. This will also provide methods in the predicting reservoir performance in an integrated approach through reservoir geology, petrophysics, and reservoir engineering.

**COURSE OBJECTIVE**

- Understand the affecting characteristics of in reservoir characterization
- Learn the application of sequence stratigraphy to reservoir characterization
- Relate seismic and log data to reservoir properties (reservoir characterization)
- Manage risk factors and error margins in predicting depositional environments
- Integrate different data sets for geology, petrophysics, and reservoir engineering application
- Use geological and petrophysical data to understand the rock fabric
- Characterize the reservoir rock types using logs, pressure data and SCAL data

- Predict local variations within the reservoir
- Understand the integration between static and dynamic data
- Build a geological framework with a zonation scheme that honours the flow units.
- Understand how to integrate seismic and faults in the reservoir framework.
- Learn how to incorporate fracture networks into a modelling process
- Use deterministic and stochastic algorithms to propagate petrophysical properties in three-dimensions
- Build saturation model honouring capillary pressures by reservoir rock types and fluid contacts
- Learn the process of ranking realizations and perform averaging and upscaling of properties
- Perform volumetric calculations and quantify the uncertainties.

### **COURSE AUDIENCE**

Exploration & Development Geophysicists, Geologists, Reservoir Engineers, Seismic Interpreters, and E&P Managers, who are directly involved with carbonate reservoir characterization. This course is also for those who need a deeper understanding of the methodologies through an integrated approach in geology, geophysics, and reservoir engineering.

### **COURSE CONTENT**

#### **DAY 1: Geology**

- Stratigraphic controls on heterogeneity and productivity

Stratigraphic concepts for reservoir characterization

Flow units/reservoir rock properties

1D analysis, interpretation, 2D analysis, correlation

Depositional environments

- Structural controls on heterogeneity and productivity

Key surfaces, faults

Fracture controls

## **DAY 2: Reservoir Petrophysics/Rock Physics**

- Data sources, logging tools
- Log quality control and log data normalization. Core QC
- Petrophysics conventional analysis and models
- Permeability, fluid identification
- Reservoir compartments identification
- Lithology estimates, core to log calibrations
- Rock physics, rock mechanics
- Production logs, special reservoir characterization logs
- Unconventional reservoir analysis

## **DAY 3: Seismic Technology**

- Fundamentals of seismic wave propagation
- Seismic data acquisition
- Seismic data processing and imaging
- Structural framework
- Time to depth conversion
- From seismic amplitudes to elastic properties
- What to do with elastic properties
- Seismic based fracture characterization
- Other remote sensing methods

## **DAY 4: Construction of geological models**

- What do we need from a geomodel

- What data is required
- Integration of seismic data
- Structural and stratigraphic framework
- Facies and lithology
- Porosity, permeability and water saturation
- Net to gross considerations, static pore volume
- Volumetric uncertainty analysis
- Fracture models
- Unconventional resource models
- Up scaling for flow simulation

### **DAY 5: Reservoir Dynamics**

- Important factors in behaviour of dynamic systems
- Data and interpretation for dynamic behaviour

PVT / fluid properties

Multiphase flow

Stress impacts on fluid flow

Wellbore flow

Dynamic well tests and production analysis

Performance analysis

- Forecasting economic recovery

Simulation grids, PVT data

Rock and fluid interaction

History matching and forecasting

## **COURSE CERTIFICATE**

**TRAINIT ACADEMY** will award an internationally recognized certificate(s) for each delegate on completion of training.

## **COURSE FEES**

£5,750 per Delegate. This rate includes participant's manual, Hand-Outs, lunch, coffee/tea on arrival, morning & afternoon of each day.

## **COURSE METHODOLOGY**

The training course will be highly participatory and the course leader will present, guide and facilitate learning, using a range of methods including formal presentation, discussions, sector-specific case studies and exercises. Above all, the course leader will make extensive use of real-life case examples in which he has been personally involved. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Case studies & Practical Exercises
- 10% Role Play
- 10% Videos, Software or Simulators (as applicable) & General Discussions