

Applied Reservoir Engineering

Course Price

£3050

Course Description

This course is designed to provide a solid understanding of the practical methods used in Reservoir Engineering for maximizing the ultimate hydrocarbon recovery. This course covers all aspects related to Reservoir Engineering during all reservoir life cycle, starting from the primary recovery and up to enhanced oil recovery. This course will address not only the conventional applications of Reservoir Engineering but also extends to include the topics of Reservoir Simulation Engineering. In order to support participants by a wide knowledge, special topics are included such as using conventional Reservoir Engineering techniques to identify new infill opportunities, coning control with smart horizontal wells, Fracture Reservoir Simulation and enhanced oil recovery modeling.

Course Objectives

- Understand the fundamentals and applications of Reservoir Engineering
- Have a better knowledge on reservoir fluid and rock properties
- Learn how to calculate the original hydrocarbon in place
- Learn how to identify new infill opportunities using conventional Reservoir Engineering
- Understand production optimization concept and applications
- Understand Reservoir Surveillance and Monitoring
- Gain better knowledge on water and gas coning
- Learn well testing concept and principles
- Get better understanding on Gas Reservoir performance
- Gain sufficient knowledge on reservoir simulation studies

Who Should Attend

Petroleum Engineers, Geo-scientists, Drilling Engineers and other related disciplines.

Course Content

Day 1

- Introduction
- Course Objectives
- Reservoir Engineering Fundamentals
 - Reservoir Drive Mechanisms
 - Original Oil in Place Determination
 - Reservoir Life Cycle
 - Reservoir Ultimate Recovery Factor
 - Reservoir Factors to be Considered While Recovery
 - Wettability & Relative Permeability
 - Capillary Pressure
 - Imbibition and drainage
 - Hysteresis
 - Reservoir Fluid Properties
- Oil Recovery Methods
 - Primary Recovery
 - Secondary Recovery
 - Water Flooding
 - Flooding Patterns
 - Factors Affecting Water Flooding
 - Fractional Flow Curve
 - Enhanced Oil Recovery
 - EOR Concept
 - EOR Screening Criteria
 - EOR Types

Day 2

- Original Hydrocarbon in Place Determination
 - Volumetric Method
 - Material Balance
 - Examples
 - Decline Curve Analysis
 - Examples
- Conventional RE Techniques to identify new infill Opportunities
 - Normalized Production Bubble Maps
 - Wells Completion Matrix
 - Wells Correlation Panel
 - Stick Plots
 - Estimation of Initial Rates for new Infill Wells

Day 3

- Production Optimization (Nodal Analysis Approach)
 - Objective of Nodal Analysis
 - Production System Pressure Losses

- Nodal Analysis Approach
- Inflow/Outflow Curves
- Applications of Nodal Analysis

- Reservoir Surveillance

- Importance of Reservoir Surveillance
- Reservoir Measurements Parameters
- Reservoir Monitoring Program

Day 4

- Water and Gas Coning
 - Coning/Breakthrough Concept
 - Effect of Reservoir Parameters
 - Critical Rate Calculation
 - Coning Control
 - Smart Horizontal Wells
 - Exercises for Team/Solutions

- Well Testing

- Well Test Objectives
- Define Test Input/output Data
- Types of Well Tests
- Diffusivity Equation
- Derivative Analysis

Day 5

- Gas Reservoir Performance

- Fluid Properties of Gas
- Gas Reserves Estimation
- Testing of Gas Wells
- Gas-Condensate Reservoirs

- Introduction to Reservoir Simulation

- Reservoir Simulation Concept
- Types of Simulators
- Reservoir Simulation Model
- Building the Reservoir Simulation Model
- Input Data Required
- Steps to run the simulation model
- Define Reservoir Initial Conditions
- Parameters used for History Match
- Prediction Scenarios
- EOR Simulation Modeling
- Fractured Reservoirs Simulation

- End Session/Discussion

CPD Unit

Continuing Professional Development

35 HOURS CPD