Best Technology Solutions **BTS**

Introduction to Petroleum Reservoir Engineering

Training Program

Introduction:

This course will emphasize the concepts that are most important for a reservoir engineer to analyze, understand, describe, and recommend reservoir engineering procedures, including rock and fluid properties, reservoir performance analysis techniques, well test analysis, reservoir economics, risk and uncertainties, enhanced recovery, and reservoir simulation models. Operational problems encountered by reservoir engineers and specific solution strategies to augment the recovery of oil and gas in a variety of circumstances will also be included.

This course covers the fundamentals, with a primary focus on understanding fluid flow in porous media. Participants will learn reservoir engineering based on the application of analytical techniques. Several case studies will be used to show the importance of reservoir engineering. Key reservoir engineering concepts such as reservoir drive mechanisms, volumetric, petroleum fluid properties and recovery factors will be introduced. The candidates will be provided with an overall appreciation of what the basics of reservoir engineering and an appreciation of the reservoir management process and reserves should be obtained.

Who Should Attend?

Geologists, Geophysicists, Petrophysicists working in exploration and exploitation, production engineers and technologists and anyone who are relatively new to the industry, but who have some background in reservoir geology and the production of hydrocarbons

Course Objectives:

By the end of this course delegates will be able to:

- Gain a working knowledge of how the complex subject of petroleum reservoir engineering can be applied in the field in a practical manner
- Construct well bore history schematics
- Import production data and calculate cumulative and total production
- Import pressure test data
- Determine reservoir and well bore properties
- Generate decline curves and extrapolate production and economic cut-offs
- Produce bubble plot maps of production

Course Outline:

- Introduction
- Fundamentals of Fluid Flow in Petroleum Reservoirs and Applications
- Fundamentals of Data Acquisition, Analysis, Management and Applications
- Integration of Geosciences and Engineering Models
- Evaluation of Primary Reservoir Performance
- Fundamentals of Reservoir Phase Behaviour
- Reservoir Fundamentals of Fluid Flow
- Well and Reservoir Concepts
- Fluid Statics and Fluid Distribution, Reservoir Drive Mechanisms
- Oil and Gas Well Performance, Oil Displacement Concepts
- Hydrocarbon Reserves Volumetric Method
- Well Testing and Analysis, Well Decline Curve Analysis
- Material Balance Concepts, Principles of Well Testing
- Development of Diffusivity Equation
- Volumetric Methods for Performance Analysis and Applications
- Decline Curve Analysis and Applications
- Material Balance Methods and Applications
- Artificial Lift & Reservoir Stimulation Fundamentals

- Enhanced Oil Recovery
- Types of Reservoir Stimulation
- Reservoir Simulation Model Applications
- Improved Recovery Processes: Enhanced Oil Recovery and Applications
- Fundamentals of Petroleum Economics
- Integrated Modelling and Risk and Uncertainty Analysis
- Subsurface Pressures
- Fundamentals Of Normally Pressured
- Over-pressured and Under-pressured Formations
- Overpressures and How to Detect Them
- Overpressures Due to Hydrocarbons
- Reservoir Drive Mechanisms
- Logging Whilst Drilling (LWD)
- Reservoir Rock Properties
- Porosity, Permeability, Capillary Pressure
- Effective and Relative Permeability
- Mobility Ratio & the Concept of Immiscible Displacement
- RFT & MDT
- Mechanics,Theory,Application and Interpretation in Exploration and Development
- DST: Mechanics, Theory, Application and Interpretation
- DST: Productivity Testing
- Introduction to Transient Flow Testing, Flow Regime Concept
- Quantitative Radial Flow Analysis for Reservoir Properties, Skin
- Recognising Reservoir Boundaries and Depletion
- Sampling of Reservoir Fluids, Petroleum Types and Properties
- Fluid Behaviour in the Reservoir
- Concepts in Field Appraisal and Development
- Overview of Objectives in Appraisal and Development Programs
- One Phase and Two Phase Expansion
- Gravity Drainage, Water Drive
- Rock Compressibility, Concept of Depletion
- Pressure Support Mechanisms, Recovery Factors
- Overview of Displacement Theory
- Effect of Reservoir Heterogeneity