Best Technology Solutions **BTS**

Fundamentals of Reservoir Engineering

Training Program

Introduction:

This course will introduce participants to the basics of reservoir engineering. It will cover the role of reservoir engineers in exploration and production. Participants will also learn about fluid and rock properties used in reservoir engineering applications and the fundamental concepts of fluid flow in porous media. Multiphase situations, types of oil and gas reservoirs, reservoir drive mechanisms, the basics of material balance and decline curve analysis, and reserve definitions will also be discussed. Other important concepts that will be covered include the reservoir life cycle, reservoir environment and formation properties, Darcyâ€™s Law, and API correlations. By the end of the course, the candidates will have gained a foundational understanding of reservoir engineering that they can use while moving forward in their training.

Who Should Attend?

Geologists, Geophysicists, Petrophysicists working in exploration and exploitation, engineers 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:

- Learn about the role of reservoir engineering in exploration and production
- Learn about Reservoir environment and formation properties
- Learn about the identification of contacts as well as effective and relative permeability and how to measure relative permeability
- Learn about reservoirs and surface conditions
- Learn about the application of the deviation factor to ideal gas law
- Be introduced to the application of diffusivity equation and the application of line source solution

- Recognize well testing in determining average reservoir pressure, productivity index, permeability, and skin effect
- learn about reservoir drive mechanisms and the concept of a reservoir as a single tank
- Learn about the recovery of a reservoir
- Discuss the definition of reserves and the recovery factor â€“ API correlation

Course Outline:

Reservoir and Reservoir Engineering Basics

- Introduction to reservoir engineering
- Reservoir Life Cycle
- Reservoir environment and formation properties
- Identification of contacts
- Effective and relative permeability
- Definition of reservoir pressure
- Determination of pressure gradients

Reservoir Conditions

- Reservoir and surface conditions
- Formation volume factor, viscosity, solution gas-oil ratio, API gravity, specific gravity
- Estimating gas, oil, and water properties from correlations
- Application of deviation factor to ideal gas law

Reservoir Fundamentals

- Reservoir Fundamentals
- Expansion for Gas wells applications
- Principles of Well Testing in reservoir characterization
- Estimation of average pressure

- Application of diffusivity equation to steady state, semi-steady state and unsteady state flow
- Applications of line source solution to determine reservoir pressure
- Overview of well testing techniques
- Use of well testing

Reservoir Drive

- Reservoir Drive Mechanisms
- Definition of material balance
- Determination of most effective drive mechanism
- Examination of water influx
- Use of fractional flow equations
- Immiscible displacement concepts
- Recovery concepts
- Determining initial and recoverable oil and gas

Reserve Estimation

- Definition of reserves
- Recovery factor-API Correlations
- Estimation of oil-in-place and gas-in-place
- Reserve estimation by using material balance equations