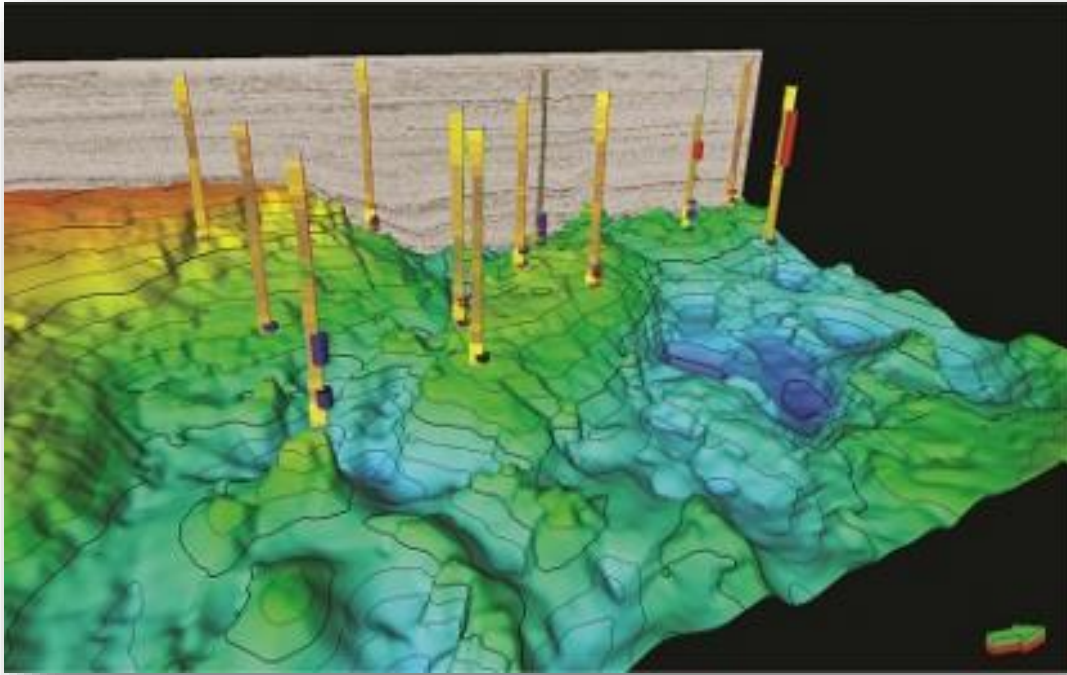




DE109

Reservoir Engineering for Non-Reservoir Engineers

Course Introduction:

This five-day course is designed for professionals who work with, or rely on, analyses provided by reservoir engineers, or who otherwise need to understand and communicate with them on a technical or commercial basis. The course provides an understanding of the underlying value and limitations of the analyses provided by reservoir engineers, as well as a better understanding of the required data and assumptions involved in the practice of reservoir engineering. Participants will obtain an understanding of routine reservoir engineering calculations, the data required to perform these calculations, the primary tools and techniques used by reservoir engineers, and the information gained by the application of those techniques. The limitations of the extrapolation of the results to the decision making process will also be covered. Throughout the course, the impact of the data, assumptions and technical limitations are related to the economic impact they have on reservoir management.

Reservoir Engineering is a comprehensive, multidisciplinary evaluation of both producing and non-producing oil and gas fields. This may include reservoir characterization, reservoir engineering analysis, field development strategy, planning, production forecasting and reserves assessment, identification of uncertainties and risks and their mitigation and reservoir management and production optimization.

This course is a problem based learning (PBL) program and provides hands on experience. Based on the data from two fields: Hatar Oil Field and Banjora Gas Field (fictitious), the course leads attendees to evaluate hydrocarbon volume in place, recovery factor, reserves, production forecasting and deliver development strategy and plan. The field examples emphasizes on the process and integration of various tasks, dealing with issues and their implications, and, above all, identification of subsurface uncertainties and associated business risks and their management.

Course Objectives:

Upon successful completion of this course, the delegates will be able to:

- ✓ Single- and multi-phase fluid flow through porous media
- ✓ Fluid phase properties during hydrocarbon recovery
- ✓ Reservoir engineering concepts and terminology
- ✓ How recovery factors and reserves are being estimated and predicted
- ✓ Typical assumptions and simplifications required to predict reservoir performance
- ✓ Capitalize on geological and reservoir engineering integration
- ✓ Gain insight into reservoir characterization
- ✓ Understand fundamentals of reservoir engineering
- ✓ Learn the place volume and recovery factor estimation techniques

- ✓ Gain practical knowledge on field development planning
- ✓ Apply analytical method for production forecasting and reserves estimations

Who Should Attend?

This course is intended for geoscientist or engineer with little or no reservoir engineering experience such as; Fresh Graduated Engineer, Geologist, Geoscientists, Technical Support, Field Support, Financial, Accounting, Legal, Drafting, Procurement, Investors, Analysts and Purchasing.

Course Outline:

Day 1:

- Reservoir geological description and Rock Properties
- Hydrocarbon phase behavior
 - Example PVT Studies
- Fluid and Pressures Distributions including Pressure vs. Depth and Capillary Pressure.
- Volumetric reserve estimates
 - Reserve classifications
 - Probabilistic reserve estimates

Day 2:

- Fluid Flow
 - Darcy's Law
 - Well Inflow
- Well testing
 - Pressure transient analysis methods
 - Build-up curve examples
- Gas well testing and AOF analysis.
- Vertical Lift (Tubing) Performance and Artificial Lift
- Reservoir Drive Mechanisms
 - Material balance and fluid displacement
 - Gas reservoirs
 - p/Z diagrams

Day 3:

- Reservoir Monitoring
- Simulation
- Production Forecasting

- Enhanced Oil Recovery
- Introduction to Reservoir Engineering
 - Oil and Gas Industry – A Broader Perspective
 - Reservoir Characterization – Geology & Deposition
 - Reservoir Characterization – Reservoir Properties
 - Field Development Strategy and Planning
 - Problem Solving & Reservoir Parameters
 - Reservoir Data Acquisition
- Applied Gas Reservoir Engineering: Banjora Gas Field
 - Introduction
 - Fundamentals of Gas Reservoir Engineering
 - Banjora Gas Field – Terms of Reference
 - Field description and characterization
 - HC in-place volume estimates and uncertainty range
 - Reservoir drive mechanism/s
 - Estimation of gas recovery factors
 - Development strategy, plan and management
 - Reserves estimations and production forecasting

Day 4:

- Applied Oil Reservoir Engineering: Hatar Oil Field
 - Fundamentals of Oil Reservoir Engineering
 - Hatar Oil Field – Terms of Reference
 - Effective Communication
- Introduction to the physics of petroleum reservoirs
- Fluid properties in reservoir engineering - fluid types, phase behaviour, correlations, equations of state
- Fundamental rock properties - porosity, wettability, capillary pressure, permeability, relative permeability and other concepts
- Evaluation and recovery of oil and gas reserves - classification of reserves, recovery factors, volumetric of oil and gas reservoirs

Day 5:

- Material balance calculations
- Oil-water displacement - mobility ratio, Buckley-Leverett, displacement efficiency
- Well Performance
- Introduction to Transient Well Test Analysis
- Decline curve analysis

Course Certificate:

International Center for Training & Development (ICTD) will award an internationally recognized certificate(s) for each delegate on completion of training.

Course Methodology:

A variety of methodologies will be used during the course that includes:

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires
- Group Work
- Discussion
- Presentation

Course Fees:

To be advised as per the course location. This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Timings:

Daily Course Timings:

08:00 - 08:20	Morning Coffee / Tea
08:20 - 10:00	First Session
10:00 - 10:20	Coffee / Tea / Snacks
10:20 - 12:20	Second Session
12:20 - 13:30	Lunch Break & Prayer Break
13:30 - 15:00	Last Session